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BRIEFLY TOLD.

THE PERMANENT BADGE OF THE WESTERN ASSOCIATION.—There must be something peculiarly attractive about identification by symbols, for almost every society in the civilized world has its badge of membership. Nor is it to be denied that such practice is without useful effect, since many illustrations of their effectiveness at odd times and in strange places could be cited in support or proof of that assertion. Our Associations, however, seemed to have paid but little attention to the permanent badge as a means of identification, but with the decision by the American Association to thus punctuate its membership, the acceptance of the idea by the other Associations was not slow, wherefore we may claim that it was neglect alone which prevented an earlier general adoption of the plan. Whether neglect or indifference is chargeable with this dilatoriness is of no moment now, because, if we mistake not greatly, all the Associations—save the New England and the Ohio—are thus equipped. To go back a step, in explanation by way of correction. The American Association has been credited by us with being the one to initiate the permanent badge system; but in reality that credit should have been given to the Society of Gas Lighting, and the second place should be awarded to the Guild of Gas Managers; the design of the badge used by the latter being, to our mind, the most artistic of all.

In this installment of our report of the Western's Cincinnati convention is printed the discussion that followed the report of the Committee on Permanent Badge, and thinking that the conclusions reached would be made more understandable were an illustration of the design adopted also to appear in our columns, we herewith present the same. For the drawing we are indebted to Mr. George T. Thompson, of St. Louis.

Permanent Badge, Western Gas Association.

The specifications accompanying the design as forwarded to the jeweller are appended: The badge to be stamped in a die. Bar, representing a length of main pipe, half-round, to receive name of owner, if desired; pendant, carried by chains of 5 links each; rim of mouthpiece (pendant) raised slightly above level of letters and sun, and background deepened below these latter; bar, and chains, and sun, and rays on pendant, to be in natural gold; background in center and dots (mouthpiece bolt holes) to be enameled in black; letters "W G A" enameled in red; to weigh 3½ dwts.

PRESIDENT RAMSDELL'S REMARKS ON LEGISLATION.—Although we alluded before to Mr. Ramsdell's pronounced and politic remarks, respecting the value and efficacy of State gas commissions, in his address before the Western Association, we are again moved to draw attention to them because of the outcome of the resolution, adopted just before the adjournment of the Chicago Convention of the National Electric Light Association. This resolution created a "National Committee on State and Municipal Legislation" (to consist of one representative from each State and Territory of the Union), and the plan of work set out for the Committee is thus arranged—we reprint this because it seems to us that it would be well worthy of the close attention of the executive management of the American Association. The scheme here outlined looks to us to meet all the objections that were urged in the meeting of the Executive Committee (New York, 1887) of the American Association, when it was decided to report "that it is inexpedient to take action upon the subject"—*i. e.*, "Gas Commissions," which matter had been referred to the Committee from the convention of the preceding year. The electricians' plan, however, is:

"1.—An examination will be made of the laws in each State to see in what particulars, if any, the electrical industry can be benefited by securing any practicable change in such laws.

"2.—All bills, affecting in any way the interests of the electrical industry, that were introduced at the last session of the Legislature of any State, but which did not become laws, will be examined to ascertain the *tendency of* legislation, and to see if it is desirable that they should be passed.

"3.—Whenever any legislation is desired in any State, or if legislation is proposed that is not desired, copies of the bill proposed will be furnished to the chairman of the committee. He will then furnish the members of the committee for that State such data, arguments and citations as he may be able to provide, to enable said member to place information in the hands of proper persons through whom the desired result may be secured.

"4.—All work done in one State will be kept in printed form, so that it can be used at once in any other State. The work will thus become accumulative, and of such a thorough character as to be practically irresistible.

"5.—No legislative measure or economic principle will be advocated in any manner in the name of the committee, without the approval of a majority of the whole number of its members; nor will the committee undertake to secure legislation in any State without the approval of the member for that State, and then only when sufficient preparation has been made to render success a reasonable certainty.

"6.—Each member of the committee will recommend to the chairman an attorney for his State, who will receive and preserve for reference copies of all documents published or approved by the committee, to the end that if it at any time becomes necessary to employ counsel in that State, or if any special interest requires such service, said attorney will have the desired information, and can represent the committee, or such special interest as may wish to employ him, and have at his command much of the data necessary to familiarize himself with the subject.

"7.—All other considerations being equal, an attorney residing at the capital of the State will be preferable."

These rules and regulations are simple enough, and are quite certain to result in benefit for the interest in which they were framed. One fact also becomes more pronounced with each year, and that is the conviction that sooner or later the gas interest will be controlled by special enactment. Would it not be wise, then, that these special enactments should spring from the gas man rather than from the State?

A Wise Course.—Another point in connection with the meeting of the Western Association that should receive proper recognition is the sound way in which the members ratified the action of the Board of Directors with respect to the refusal of the latter to endorse the paper presented by Mr. W. L. Brown, of Evanston. Of course, it is not our purpose, nor could it be rightfully our privilege to comment here on the reasons that led the Board to pass the judgment rendered; and each of whom beyond a doubt it may be said was sorely troubled over the necessity that compelled him to so decide. Our commendation of this action on the part of the members in sustaining their Directors springs from the broad basis that if those in authority are not upheld when the rough places are encountered, then is an end put to discipline. Mr. Brown, too—and there is no more thoroughly cultured gentleman in the Association—is to be numbered among those who are to be condoled with because of the injudiciousness of their champions.

The terrible disaster of the Conemaugh did not spare the fraternity an especial shock. At present writing we understand that the Johnstown plant and also the one at Williamsport are completely wrecked.

Among the travelers on the day express that was caught in the hills on that eventful Friday were Messrs. E. H. McCullough, of the Westmoreland Gas Coal Company, and W. H. Baxter, of Lima, Ohio. Both are safe and sound.

In our item columns will be found information that the Connecticut House adopted a resolution empowering the Hartford Light and Power Company to engage in the supply of fuel gas. Last week, however, the Senate again rejected the amended measure, by a vote of 14 to 7.

Some of the residents of Huntington, L. I., are making strenuous objection to the construction at that point of a gas works, a franchise for which is held by Mr. Geo. W. Olney. The objectors urge that all the oysters, clams and fish in the harbor would be killed by the refuse discharged from a gas works, wherefore it would appear that the people must grope in the dark in order that the fish may live. But why should the fish not live and the people have gas, too? There is nothing to prevent such a state of affairs. In the meantime, it is about settled that Mr. Olney shall go ahead.

[Official Report.—Continued from p. 732.]

Twelfth Annual Meeting of the Western Gas Association.

Held at Cincinnati, Ohio, May 15, 16, and 17, 1889.

First Day—Afternoon Session.

Report of Committee on Permanent Badge.

The President—As the Committee on Badge are ready to report we will receive their recommendations now.

Mr. King—I will say that the Committee have labored faithfully to reach a conclusion which shall be satisfactory, as they hope, to the members of the Association. The question of a button came up and was discussed, and a sample button was made; but it did not seem to exactly fill the purpose. We wanted something that should be distinctively a gas badge. We thought a badge would be better than a button. We owe this design to a suggestion from Mr. Egner, and I understand that it was gotton up by Mr. George T. Thompson. Mr. Thompson wrote me in sending it that the setting sun is intended to represent the West, while the retort is emblematic of our work, and the chain may indicate the links that bind us together in our Association. We, first, ordered from New York a badge made, but could only get partially what we wanted. The die for the badge would cost $30 or $40, but subsequently what he gave us must be engraved. I have it here, and I will read the specification for it. The badge, as proposed, will be in 14 karat gold, weighing 3½ pennyweights, the bar of the badge to be shaped like a gas pipe; the retort to be black in the center, with the sun and rays in gold, and the letters "W. G. A." in red enamel, with a fine outline of gold, the rim of the retort raised. The badge will be finished in the finest possible manner, and will be furnished for $3.25 each, in lots of 100 We consider that cheap, and although we have had some adverse criticism, it is probably, as far as we can see, as nice a badge, and as distinctively for gas men, as anything that could be designed.

Mr. Brown—Is it to be fastened with a pin?

Mr. King—Yes.

Mr. Thompson—That bar will be continued for the engraving of the member's name.

Mr. Egner—We did not want to put a monogram on, and we wanted to use the badge under different conditions and different places. We can do that with this badge, and the letters "W. G. A." could stand for "Western Growler's Association," when the wearer was in one place, whereas it might be emblematic of "Water Gas Association," when he was in another locality. So that you see it unites us all. Then there is the setting sun—although, really, I don't know the difference between a setting and a rising sun; still that is supposed to be a setting sun. As "Westward the star of empire takes it way," anybody who saw this would know it to be emblematic of the West. I might better stop now for fear something that I would say should "put me in a bad hole." So I will not say much more now, but will tell it you later—down-stairs. (Laughter).

The President—You have heard the report of the Committee on Badge. What shall be done with it. This is the result, as I understand it, of a great deal of labor on the part of the Committee.

Mr. Gimper—I move the report of the Committee be accepted, and thanks returned to them for their labor, and that we adopt the badge also as the badge of the Western Gas Association.

Mr. Lansden—I would suggest that the members have the privilege between now and to-morrow of entering their names for badges. I do not suppose that we will order them unless the members will agree to take them. Before the meeting adjourns the Secretary should know who will take the badges. Before we order a hundred we want to know that they will be taken. We may want 200 or 300. But at this stage of the proceedings I do not think it would be policy to adopt the thing and commit the Society to it, unless each member signifies his williugness to take a badge.

Mr. King—Why would it not be well, if this is satisfactory, to accept the design, and then whenever the order reaches a hundred order them to be made.

Mr. Landsen—Something of that kind; but put it in a distinct shape.

The President—Are you ready for the question?

Mr. Cowdery—It is suggested that it might be well to change that motion to this, that the membership fees of the Association be increased to $10, and the annual dues increased to $5, and that the Association buy the badges and present them to each member.

Mr. Jenkins—Then all the members who would come in would pay an increased membership fee and get a badge; while we old members get the badges for about nothing, except the increase of the annual fee. That would be all right for the first year, but what is the use of that for five or six years after this. I think that the best way will be for each member to understand that he pays $3.25 for his own badge.

The President—I do not understand that we can at this time make any such change as is suggested by Mr. Cowdery. That would have to come in, in its regular order, as an amendment to the constitution or by-laws. The question is now on the adoption of the report of the Committee. Let us dispose of that first, and then if the other matter is to be brought up it will have to be done in another way. [The motion was put and adopted.]

The President—Now the question is on the adoption of this design for a badge. [The design* submitted was accepted]

Mr. Jenkins—Will the Committee or the Secretary order them?

Mr. King—I suggest that the orders be left with the Secretary, or with Mr. Thompson; and whenever these reach 100 in number the badges can be ordered.

Mr. Steinwedell—Will not the Secretary attend to that, and to the distribution of the badges.

Mr. Jenkins—The Secretary had better order them and distribute them.

Mr. King—There is one other thing in connection with this. It is always nice to have some memento of a important event in a person's life, and although this is not the badge that is to be used, except in the design, still I wish to present to our President this sample badge as a memento of this meeting. Let this be specially for him, as it is the only one of this design. Although it is not as beautiful as the others, it may be that it will be an interesting memento to him of this occasion. [Applause.]

The President—I assure you, gentlemen, I appreciate very highly the spirit of this gift, as well as the gift itself.

Mr. Jenkins—I move that when the first hundred badges have been subscribed for they be ordered through the Secretary, and that he forward them as received, and that a like order be sent for each additional 50 badges.

The President—I wish to suggest one thing in connection with this. The Secretary has a pretty heavy load of work to carry, and it would save him a good deal of trouble and annoyance if the members in ordering these badges will at the same time enclose in their letter $3.25. Or, if they give him their names at this time, they can send him the money after they get home. While it is a small matter for any one person, it is a good deal of a matter for him to write to 50 or 100 members to ask for the remittance. It has been suggested that the names be handed to Mr. Thompson, or to Mr. King during this session, and I presume that they will accept the money also.

On motion the Association then adjourned, to reconvene Wednesday, May 16, 1889, at 10 o'clock A. M.

Second Day—Morning Session.

The Association was called to order at 10 A. M., and the proceedings were opened by the reception of the following report from the Committee on Nomination of Officers:

Election of Officers.

Mr. Somerville—The Committee on Nominations report the following gentlemen to serve the Association for the next year:

President, E. J. King.
First Vice-President, C. R. Faben, Jr.
Second Vice-President, Frederic Egner.
Secretary and Treasurer, A. W. Littleton.

The Committee thought it best to depart somewhat from the usual course of selecting a Board of Directors, because of geographical lines, as they fully recognized the great importance to the Association of this branch of its executive management. Having reasoned it over, the Committee concluded to have the Board membership selected from those whose residing places are not so far apart as was generally the result under the former practice. The following are named for

Directors—J. B. Howard, E. H. Jenkins, Z. T. F. Runner, John Gimper, S. W. Butterworth, E. J. Cowdery, J. S. Ambrose, J. W. Dunbar and B. E. Chollar.

Mr. Lindsley—I move that the report of the Committee be accepted. [Adopted.]

On motion, the Chairman of the Committee (Mr. Somerville) cast the ballot of the Association for the persons named.

The President—I suppose it will be in order for the Association to hear at this time from our newly-elected President, Mr. E. J. King. (Applause.)

Mr. King—I should not attempt to take up your time this morning, even if it were possible for me to make a speech; but I feel very keenly the honor you have conferred upon me. I know, and you all know, that my difficulty will be in following such a man as he who presides over this meeting. I ask your co-operation in helping to make the thirteenth annual meeting such a one as this has been under his able management. Gentlemen, I thank you. (Applause.)

* For design and description, see page 757.

Report of Committee on Place of Next Meeting.

The President—The next business will be the report of the Committee on the next place of meeting.

Mr. Chollar—The Committee are unanimous in recommending that the next meeting be held in St. Louis, Mo. There is no difference of opinion whatever. [On motion, the report of the Committee was received, and the recommendation adopted.]

Mr. J. B. Howard—I do not know whether what I am about to say may seem appropriate or not, but in my opinion we ought to have the matter ventilated. You all remember that at our last meeting in St. Louis we were entertained in magnificent style, our entertainers having, without regard to their outlay, gone to great lengths for the purpose of giving us all the pleasure that they could. While this, of course, is pleasing to the guests, instructions ought to be given to the Committee of Arrangements not to allow the St. Louis people to go into a great expenditure similar to that they assumed on the occasion referred to. Not only should we not look for this, but we ought not to permit it. You well remember the banquet at the Southern Hotel, with its magnificent display and consequent outlay; and the scene at the hotel was duplicated the following day at the Fair Grounds. Now, all this costs money; and we also well know that the money comes out of the same hands every year. Even in Cincinnati the same parties (or many of them) are interested in our reception here, and so it is also in Chicago. I really think steps ought to be taken to keep these expenditures within proper limits. I would like to have the sense of the meeting with regard to it. If we want a banquet I believe the right way is to pay for it from our own pockets. (Laughter.) Even if that meeting at St. Louis was one of those happy episodes that we shall never forget, I fail to see why it would not be good policy to pay for our own entertainment.

Mr. Chollar—The committee for selecting and recommending the place of meeting heartily endorse the remarks of Mr. Howard. We devoted not a little time to the matter, and were inclined to report on it formally; but as a committee we were bound simply to recommend the location, and hence thought it was hardly our place to go outside of our instructions. We, however, heartily endorse the suggestion of Mr. Howard.

Mr. Ambrose—One of the most difficult matters that I have ever had to handle in my life is what is called the family matter. You know the old custom is that if we take sides with the wife she will probably turn around and join her husband, when, with united force, they will give you a sound thrashing. I think this is a sort of family matter, and thinking so, I fail to see how we can say to these people that they shall not spend their money in the way they want to. Why, they are growing very rich over there—I suppose you all have heard of the syndicate recently formed in that city—and if those people have not sufficient financial ability to keep their money, but are determined to spend it for our use and benefit every time we go there, I am one of those who are willing to vote to go there every three years and give them the opportunity. (Laughter.) Don't let us restrict them. Let us give them full scope. Let us give them rope enough. I don't believe, though, that they will hang themselves. They will get the money back out of us; and so I hope that instead of limiting them you will give them full sway. (Laughter.)

Mr. Scofield—The fact that the local committees have shouldered large burdens and heavy expenses seemed to me sufficient reason for making an effort for a different arrangement. We have been saddling too heavy a burden upon the local committees wherever we have met. I therefore move that it is the sense of this meeting that hereafter if banquets are given for the entertainment of this Association, that the same be given under the auspices of the Association.

Mr. E. L. Brown—I second the motion.

The President—It is moved and seconded that hereafter the banquets given to this Association be given under the auspices of the Association.

Mr. Scofield—*If* given.

The President—Any further remarks?

After Mr. Lansden had spoken against the adoption of the resolution the latter (on motion of Mr. Page) was laid on the table.

Naming the Committee of Arrangements.

The President—I will announce that the Committee of Arrangements for the next meeting will comprise Messrs. R. D. Walsh, John Dell, D. R. Russell, J. D. Thompson, Jas. Daniels, E. T. Howard and E. Worcester.

Disposing of the Proposed Constitutional Amendment.

The President—We will, in accordance with the constitution, read for the second time the amendment recommended by the Board of Directors. It is as follows:

"The following amendment to the by-laws was moved, seconded, car-

ried, and is herewith recommended for adoption, viz., a section to be added to Article II., as follows:

"'*Section* 2. If, by reason of change of occupation, a member should thereby become disqualified to continue as an active member, or become eligible from associate to active membership, the Secretary shall report the fact to the Board of Directors, who shall, upon due examination, cause the necessary change to be made upon the roll of membership of the Association until further notice.'"

Mr. Odiorne having moved the adoption of the amendment as read, the following debate ensued:

Mr. Henry Pratt—I do not know how members that have been engineers, superintendents and the like, and who understand their business, can be reduced in rank on our rolls. Why it should be done I do not really know. I have been an active member for a long time—ever since I joined the Association, in fact. I asked for a ruling with regard to it last year from our President, because I did not know how this amendment would affect me. I do not think that I know any the less about the gas business because I happen to change for the time being from one business into another; nor do I understand how I am any the less fitted to vote on the business of the Association. What the precise object of the amendment is I cannot fathom.

Mr. Lansden—Do I understand the sense of the resolution to be that a man who has been an active member of our Association, but who loses his position, is any the less a gas man or an engineer, in consequence of the change? From my understanding of the amendment it gives the Directors power to reduce that man on our rolls, and to deprive him of a vote in the Society.

The President—That would be the effect. The amendment would change on the roll the name of an associate member to active membership, who has changed from some line of business—such as furnishing gas work supplies, machinery, or anything of that kind—to become an executive officer or engineer of a gas company. If, on the contrary, he goes out of the gas business and into some other business, it would have the effect of changing his name from active membership to associate membership.

Mr. Lansden—But if he did not go into any business; would that put him in the position of an associate member, and would he lose his vote in the society?

The President—He would not then be disqualified, in my judgment. [The amendment was then put to vote, and *lost*.]

A Telegram from Prof. Mendenhall.

The President—I have a telegram which I know you will join with me in doubly regretting to hear—first, because of the Professor's affliction; secondly, because it will deprive us of the lecture which he was to have delivered before us this afternoon. The Professor's message is:

"The sudden death of a near friend prevents my going to your Convention. T. C. Mendenhall."

Sustaining the Board of Directors.

At this point Mr. George Shepard Page, rising to a question of privilege, called attention to the fact that a paper, by Mr. W. L. Brown, of Evanston, Ills., entitled "A Winter's Experience with a Springer Plant," had not been accepted by the Board of Directors. Mr. Page's statement (he favored the reading of the paper) led to a lengthy discussion, the result of which was that the action of the Board in refusing to accept the paper was indorsed by the Association.

Mr. George T. Thompson, of St. Louis, Mo., then read his paper on

RETORT HOUSE WORK.

Upon entering the gas profession, Samuel Clegg's maxim that "In the retort house the money is made," was strongly impressed upon me by the engineer and superintendent of the works at which I am engaged; and the force of this aphorism may be appreciated when it is considered that in the purifying plant, for instance, a saving of 25 per cent. in the cost of that process would amount to but a small fraction of a cent per thousand feet produced, while in many works a more careful attention to some details of retort house work would result in a saving—expressed in terms of the carbonization—of 500 to 1,000 feet per ton, or even more. This equals, in most places, a gain of from two to five cents per thousand; small, apparently, yet large in aggregate economy, or compared with other departments of gas manufacture. While the matter of unreasonably high wages and unnecessary labor must be looked after and regulated to some extent by the prevailing customs and conditions of the locality, but far the more important items which enter into the making of the money in a retort house are the numerous little features of the *work;* the tricks of the trade, so to speak, which will be made the subject of this paper.

It goes without saying that a pre-requisite to satisfactory results is a properly built and furnished house and bench stack; but as these points belong rather to retort house construction, I will touch only such of them as cannot well be avoided when treating my present subject. The *work* properly begins at the coal pile in the shed or yard next to the retort house. If we have but one kind of coal, and that of uniform quality, there is little occasion for the practical gas maker to do anything with the coal pile, except to see that the charges are brought in of the correct weight found to be most suitable for economical carbonization. But if we have several kinds of coal, much can be made by good judgment in using these. For example, if we have one variety of coal partly in shed and partly exposed to the weather, it is best to use the outside coal first; or should we be limited in retort capacity and not yet be blessed with electric lighting in our streets, we may take the dry coal when the moon is on a vacation, but when she is on duty and we follow the moonlight system, we may perhaps, by using the wet coal or slack avoid letting down or "missing" benches. These remarks also hold good in case we have different kinds of coal, ranging from very good to cheap and bad, and it may thus pay to have a little cheap coal on hand for use on such occasions. Another point is that by mixing with a good gas coal, such as, for example, the Youghiogheny, Penn or Westmoreland, a proportion—say, one-fourth—of cheaper coal like the Indiana, Cumberland, or Nova Scotia, the net results will be improved. This may be explained by the fact that coals lighter in gas are usually carbonized in less time than the richer varieties, and thus swelling more than the latter, permit the heat to act more thoroughly on the whole charge.

Now, having decided which of our coal we are to use, and having it in our retort house, and the large lumps broken to suitable size, the next step is to get our charges into the retorts so as to get the best results. We have manual and machine labor to draw coke from and charge coal into the retorts. Having had no experience with the machines, but being able to speak from observation of the Ross stokers at Cincinnati, Boston, both stations of Branch Two, Consolidated Company, of New York, and the Point Breeze station at Philadelphia, I am strongly of the opinion that all works operating a sufficient number of retorts would save money by introducing the machines. The manual charging of retorts may be done by shovels, or by scoops, and both methods have earnest and able advocates. My own views are in favor of the scoop.

The arguments for the use of shovels set forth that the retorts do not remain open so long; that the coal can be thrown to any portion of the retort, as desired, and that one man alone can charge the retort. The last of these arguments is the only really strong one, and even this does not apply when a sufficient number of men are employed to handle a scoop, or where the manager is of an inventive turn and rigs some device by which one man can use it. To the second argument it can be said that the coal may be easily placed in any desired position with the scoop by loading it accordingly. To the first I can safely say that, while the lids may be off a few seconds longer when charging by scoop, the time the retort remains open after the first coal has been put in and has, consequently, *commenced to make gas*, is very much less by the use of the scoop than when using the shovel. Then, too, far longer practice is required to charge well with a shovel than by scoop, although the latter is, of course, not learned to perfection in a day. In the use of scoops, several points require attention. *Rushing* the scoop tends to heap the coal in a portion of the retort and produces in that portion the same bad effect as if the retorts were overcharged. For the same reason when driving a second scoop after the first, the scoop-loads should not be put in crossing one another; and as an element of carelessness, or even malice, may enter into this work, the driving or guiding of the scoop is usually assigned to the man responsible for the heat of the bench that is being charged. To lessen their own work in drawing, men sometimes overload the retorts their companions are to draw. If from any of these causes the coal lies "bunched," the bench may be hot enough, and yet in the retorts thus treated the obtainable results will not be reached, and at the draw the dark-spotted retorts and volumes of smoke will tell the tale of loss. By raising or lowering his side of the scoop a malicious or negligent scoop carrier may cause his companion to bear more than his share of the load, or may injure the driver by striking the mouthpiece. Throwing the scoop upon the mouthpiece must also be avoided, as this tends to weaken the joint to the retort. If the scoop charging is carefully done there will be no necessity for the use of the leveling rakes to push back the coal which is sometimes dropped on or very near the mouthpiece, and thus valuable time and gas will be saved.

Stoppages in ascension pipes are a source of loss and annoyance, and many remedies have been proposed. One of the best preventives is in clearing them thoroughly from below before each charge, and if this is

done there will be little trouble from stopped pipes. But men are very prone to slight this "augering," especially at the last draw on a watch. The tools for the purpose as ordinarily made require considerable blacksmithing skill; but any one able to handle a hammer and chisel can make one which consists of 5 thin steel discs, the largest nearly the size of the standpipe and the smallest of about 2 inches diameter. An iron rod shouldered to the usual long handle passes through the centers of the discs and through short nipples of gas pipe which separate them, and the whole is secured by a nut and washer at the top. This article has been pronounced by those who have used many other forms of the tool as the most effective they have ever seen for the purpose.

Another excellent precaution against stopped standpipes is in having the front bench walls of sufficient thickness and distance from the pipes, thus lessening the chances for the pitching of suspended tar during its passage to the hydraulic. Men sometimes place wet coal in the mouthpieces to reduce these stoppages; but this is, of course, a loss of the coal thus treated, and also slightly increases the purification by adding to the production of hydrogen sulphide.

However small the works, the practice of opening an entire bench at once can be improved upon by drawing but a retort or two per bench at a time. This is plainly a saving both of radiation per bench from the open retorts and by the less effect on the heats from the body of cold material charged. At the draw it is important that the retorts be well cleared, for if coke is permitted to remain, the introduction of coal is apt to push it to the back and add to the deposit of carbon there, making more frequent scurfing necessary. Retorts showing cracks or leaks should be given attention before recharging. The smallest amount of water found sufficient to quench coke is the best. Additional water only requires additional heat to expel it when the coke is burned.

But bad charging and stopped pipes are not the only sources of loss in gas, as of course you all know. Poor heats, which may be caused in a number of ways, are more greatly responsible. In addition to strength and endurance, a certain amount of skill is necessary to a good fireman, and it is easy to lose a man's wages in gas by employing poorly qualified workmen. For instance, by continually prodding at his fires one stoker may burn more fuel than another, and yet bring down his own heats. Poor heats mean poor yields and poor coke, and hard work to draw even that; and poor coke begets heats still poorer. In this way it is easy to reduce the yield by one-fourth to one-half a cubic foot per pound of coal; and this loss reckoned in dollars and cents for the year will be found to outweigh immensely the saving sometimes sought by the reduction of the help necessary in the retort house or by paying such wages only as men can easily obtain at other less trying work. If the furnace be clinkered just *after* the charge the heat will be reduced materially, and the next draw will show this. Hence the proper time to clinker a furnace, shake it up, or fill it, is just *before* the draw. Though the clinker formation is removed in a general way at frequent intervals, the furnace is clinkered thoroughly but once in 24 hours, and then it is of consequence that the fireman removes especially the slag back of the grate-bars, which would otherwise accumulate there, and by forming a "seat" obstruct the passage to the rear of the setting and lower its heat. Quick work is especially desirable here. The clinker should be cut or thrust away, rather than be broken with a heavy bar. Firemen sometimes seek to *burn* away their more obstinate clinker by placing against it pieces of retort carbon; but as this substance now commands a good price for electric light pencils the practice is plainly wasteful.

By allowing the ashpans to become dry, or hot cinders to remain in them, it is easy to burn out the furnace bearing-bars, and these are very difficult to replace without letting down the bench. It may be remarked that triangular bearing bars are the best form, permitting the grate-bars to be reached at all points by the ascending moisture, which also retards the formation of clinker and slightly assists in generating a producer gas. In "shaking up" the fire the clinkers most easily loosened are drawn out and the grate-bars cleared; the hot fuel from the back of the furnace is then drawn upon the bars and covered with fresh coke, the first shovelful spread near the door to shield the workman, the rest filled in from back forward. Some firemen build elaborate fronts to their fires; but this usually consumes valuable time, and its effect can be reached more simply. The fire-doors should fit snugly and be kept tightly closed; a careful workman will cover any cracks at the top with dust. When the ashpans are cleaned it is well to sort their contents for any coal or good coke which may have fallen in during charging or firing.

The firemen should not be permitted to adjust the dampers; if there is no retort foreman it will be advisable for the superintendent to attend to this personally. Too large an opening permits air to rush through the furnace, lowering its heat and consuming extra fuel without being necessary to support combustion; an insufficient opening is damaging to the heat by affording too little draft, and practice alone can determine these limits. A deposit of scoria frequently collects on sharp corners throughout the oven, particularly in narrow passages at the sides and between superposed retorts. If this is neglected the mass may become so considerable as to require the use of chisel bars and sledges and the removal of a portion of the front bench-wall, unless the flue stoppers are large and conveniently placed.

In this matter of prime importance to a coal gas works, whatever its size, the recuperative or regenerative furnaces admit of keeping uniform heats far more easily than with the direct firing furnaces, save labor and use much less fuel, and it is surprising that their use is not yet universal. With these the coke is usually fired hot as it is drawn from the retorts. In some places chutes for hot coke are used with the old style furnaces also with good effect.

More or less directly connected with retort house management are several other points in which a saving may be effected. It is strange that there are still works in which the value of the exhauster is not recognized. The use of an exhauster overcomes the resistance of the other apparatus, and by decreasing the pressure within the retorts saves gas from leaking, and makes less frequent the necessity for scurfing, which results in an actual gain in retort capacity. The accumulating of carbon is also lessened by reducing the hydraulic seal or employing some variety of the many anti-dips. If carbon is allowed to gather to such an extent as not to be dislodged by 24 hours' scurfing in the ordinary manner when its removal is sought, the retort is apt to be endangered by unequal expansion at the burning carbon and where the air strikes the bare fireclay.

The inconvenience of insufficient holder capacity is most felt in the retort house, especially where the moonlight schedule of public gas lighting is followed. Under these conditions it is often necessary to keep under slow fire extra benches for use at short notice; these are known in retort house parlance as "blind fires." Their best results are obtained when some regular bench (that with the poorest heat) is "missed" once in a watch and the blind bench charged instead. Or half a retort of coal may be left out once in a watch in each of several benches and charged instead into the blind bench. This gives economy of fuel, more thorough carbonization and a better effect on the retorts than letting down entirely and again firing up to meet a temporary want. If the limit of available storage room is on any day so nearly reached as not to accommodate the excess of make over sendout until the hour of greater consumption than production, the make must, of course, be temporarily decreased. In accomplishing this it has been found better to "miss" charging entirely than to charge lighter; for this latter is apt to cause trouble when the usual weights are resumed. Should any retorts require scurfing, an excellent opportunity is here afforded. If draws must be missed let them be (if circumstances permit) those before the time for clinkering fires and at the time the retorts charged, just after clinkering, were to be drawn; as in the first case the men are relieved of work at a time when such respite is most appreciated, and in the second the heats are the poorest on the watch. In the other extreme of inadequate holder space when pressed for gas, little being on hand, the retorts may be drawn half an hour or an hour ahead of time and immediately recharged, as it is well known that the best gas and that in greatest quantity is evolved during the first hour of the charge. Another mode of relief is to carefully pick the coal, rejecting for the time all but lumps. Recourse may also be had to the use of oil, then running the exhauster somewhat faster.

From necessities of custom, contract or competition, the illuminating power of ordinary coal gas is almost everywhere raised by gas from other material richer in hydro-carbon. In many places cannel is the standby, used in various percentages, constant or otherwise. At a number of works oil is used in the double capacity of enricher and solvent for the prevention of naphthaline. About the simplest method of using oil for this purpose was described in the AMERICAN GAS LIGHT JOURNAL of December 16, 1886, and January 17, 1887, and I will therefore not attempt an account of it; but can say from personal experience with the process that I know it to be as effective as described. It is applicable to works of any size and is not patented.

A few general rules which have proved themselves of value may not be out of place. In yard or outside work preference should be given, especially in hot weather, to men able to do retort house work. While a man is heated it is not well to reprove him, except for a flagrant offense. "General Utility" should be made the motto of the retort house worker, and to accomplish this the manager should give his men opportunities to become familiar with all parts of the work. Have some

regular day for cleaning up, oiling cotter-bar screws, etc., and let there be no misunderstanding about the duties of any workman. Examine daily seals and all valves on hydraulic mains, or elsewhere about the works. Brick up furnace doors and close the lids on benches; let down next those in action. Inciting competition between shifts or gangs of men assists results, and where the gangs are too few in number to be arranged with two working at once, *timing* the work in drawing and charging will have much the same effect.

In large works the station meters are read hourly. The same practice in a small works, whose manager may not realize that seemingly trifling matters so materially affect results, would convince him of the value of attention to details and go a long way in proving that "In the Retort House the Money is Made."

Discussion.

The President—This is a very carefully prepared and valuable paper, and I trust it will receive the attention it deserves. It is now open for discussion.

Mr. Egner—I wish to say, in connection with this and the paper read yesterday about a school for gas engineers, that this is a practical illustration, if not of a school, of a scholar. Mr. Thompson came to my works as a graduate of one of our St. Louis educational institutions; and he came there to be a gas engineer. He wanted to begin by making experiments in the laboratory, drawing gas apparatus, and all that sort of thing. I told him then what I thought he would have to do, and he did it. On top of the retort house stack he got heated and dirty, like a man will who draws his first retort. He went into and helped clean the station meters, stood by and helped in the purifying house, and got himself in such a condition that he had to take his clothes off at the works and put on others before he was allowed to go home. He spent days and weeks in the retort house, but not so many as he would have to have spent there had he not had a great deal of the theory of the work at the start. We have a sort of a school there at the Laclede gas works, anyhow. I have several of my pupils around the country now. One is in a situation where he has a salary of $2,000 a year. They learned the theory and then the practice. Mr. Thompson, as you see, is a young-looking man (I hope he will pardon me for alluding to him so prominently); but he knows the business far better than many a gray-headed man that I have met. (Applause.)

The President—A scientific education did not hurt him to commence with.

Mr. Egner—No; it did not. I want also to say that the subject of the paper, "Retort House Work," was suggested by me, not that I thought it was instructive to the members of the Association, for I took it for granted that every member of the Association who is a practical gas man had gone through that thing himself; but it was to show what a young man could learn, and to give the members of the Association a chance to judge for themselves whether he had got that knowledge or not.

The President—I am satisfied there are many suggestions in the paper that are valuable for older heads.

Mr. Somerville—I would like to ask Mr. Thompson—from what I glean from his paper I judge that he has been a close student and observer—what he thinks about the seal—I do not think he has mentioned anything about that, but it is a very important item in retort house work; and also what his remedy is when a stand-pipe stops up, or how he would prevent them from stopping. Also, what Mr. Thompson thinks is the best kind of lid. Does he believe in the old luted lid, or the self-sealing one? And there are various other things I fear he has omitted in his excellent paper. I think we ought not to let the young man off without putting him through a little at first.

Mr. Egner—I hope the gentlemen will question Mr. Thompson, for I am proud of him. (Applause.)

Mr. Somerville—Mr. Egner is out of order entirely.

Mr. G. T. Thompson—In the matter of stand-pipes—the text of the paper speaks of using the auger thoroughly as a *preventive*. In case of such a stoppage various things might be done. The use of wood in the mouthpieces is sometimes adopted, but every precaution should be taken to prevent it in the first place. In the matter of lids, I think that more properly comes within the scope of a work upon retort house construction, hence I purposely avoided it. As to the seal on the hydraulic, I think it is a very good thing to bye-pass the seal—especially where the hydraulic is not entirely level throughout its length, and the dip is, therefore, not uniform. In such a case an anti-dip of some variety is found a very convenient thing, and I should be in favor of its use. Is there any other point?

Mr. Somerville—I skipped over some other special points.

Mr. Ambrose—I think the paper is well gotten up, and that it shows a good deal of study. I hope that Brother Egner, who has had a great deal of experience, will not claim too much of this as his; for we want to give all of this to our young friend, Thompson. We do not want Egner to take too much of it. I do not want to ask any questions, but only to hold Brother Egner down until Mr. Thompson gets a chance to answer the queries.

Mr. Egner—But you cannot hold Egner down. I wish to say right here that I had nothing to do with the getting up of this paper, except to suggest to Mr. Thompson, at his request, the subject. That is all. As he did it all himself, I do not deserve any credit, except possibly for suggesting the subject.

Mr. Boardman—I would like to call attention to a point brought out by the reading of this paper, and which may teach a good many of us older people our duty. Here is an admirable paper written by a young man just starting in the profession. It has been listened to with a great deal of pleasure by many of us, and has refreshed in our minds many points which otherwise might have been forgotten or overlooked. Now each one of us can go back and see if his foreman, or the man in charge, has carried out the very point that he has reminded him of in respect to saving in work. But the great thing is it has taught us that when called upon for papers we should come forward and write them—however little we may think of our ability to do so. I hope it will be an incentive to others, when called upon to follow the example of our young friend, to come forward and read their papers. I move a hearty vote of thanks to Mr. Thompson for his admirable paper. [Adopted.]

Mr. Ferrier—I would like to ask Mr. Thompson a question before that motion is put. He says that "It is found better to miss a charge entirely than to charge lighter." I would like to ask if he does not find that missing entirely thickens the tar in the hydraulic, by distilling off the lighter constituents of the tar and leaving a sort of semi-pitch behind?

Mr. Thompson—That is a point which I did not consider; for it could be remedied by a hydraulic construction which would permit the tar to be drawn off at intervals. The idea of missing entirely was that if you decrease the weights of your charges in order to make a temporarily less make of gas, when you come to give full weights to the men they are almost always certain to insist that they are being imposed upon.

Mr. G. A. Hyde, Jr., of East Saginaw, Mich., followed with a paper entitled

METER ACCOUNTING—DO I LOSE ANY METERS?

Gentlemen of the Western Gas Association—It is not the purpose of this paper, as has been intimated, to *account* for any certain alleged erratic proceedings of a gas meter. The subject is frequently and fully thus digested by the complimenting daily press. The writer had contemplated his subject in a far more prosaic vein and more to the similitude of the latter half of the heading.

The interrogation, "Do I lose any meters?" is one any gas manager can with propriety propound to himself. I have, for myself, answered it in the negative. It has been my experience, however, to know that meters are sometimes lost without much difficulty, and in some cases the fact may never be known, or the lost one may not make its very unexpected appearance for a number of years. In conversation with quite a number of managers, I have made the above injuiry. The reply is, "I *think* none are lost." The question naturally presents itself, "Do you know for a fact?"

In further preface it might be well to state that the system herein presented is not recommended to all gas managers in the exact form as submitted, but might be amended in some particulars to meet various requirements. The city to which my company caters, boasts of a population of 35,000.

The system offered might be said to be the result of evolution, in which the surroundings of the situation formed the prototype, while the requirements proved procreative.

While there are systems extant of keeping account of the individual meter, in which the history may be traced quite minutely, still I am of the impression that while the history may be completely written, it is seldom studied, and much of the accruing information ceases to be a practical and live benefit.

I have sought rather to have a system which gives me a proof, first, that, on the first day of each month, no meter has strayed away during the mouth preceding; second, that acts as a check on errors in reading of the number and index of the meter when set or removed; third, that indicates to me at any moment the number of meters I have in use; fourth, that shows me at the first of each month the number of each size of meters I have in use and in stock.

Coming first in the system is a stub order book. (Form I). The stub

shows the number of the order; if the meter is to be "set" the "out" is crossed out, and *vice versa*. Date, name, street, etc., are added as shown, and before detaching the slip from its stub, the name of the fitter to whom the slip is delivered, is placed thereon. The slip should be filled out by the office clerk, with the exception of the meter description, which is done by the fitter after the work is finished and before returning the slip to the office.

The office record of this meter change is next made in the "Meter Change Book" (Form 2), and comprises a balance in which, on the left hand page, first line, on the first day of the month is placed the number of "meters in use," followed by the number of "meters in stock," after which follow, in consecutive numbers, the meters as set, giving date, name of consumer, street, size of meter, number, index and manufac turer, by whom set and whether for lighting or heating purposes. At the end of the month the last number is carried over into the column containing the before mentioned meters "in use" and "in stock." If any meters are purchased during the month the numbers of them are set down in this column.

On the right hand page are placed in like manner the meters removed, placing the first on the first line and numbering consecutively the removals, the last number being carried over into the next column. On the next line is placed the number representing the gain in meters "set" during the month, obtained by subtracting the whole number removed from the whole number set. On the line following is placed the number representing "meters in use" on the first of the month.

If any meters have been destroyed during the month the number is placed in the next column. On the last line is placed the difference in the footings of the two pages, which represents the number of meters in stock on the last day of the month. If I shall find that my monthly inventory of "meters in stock" equals this difference, the work proves itself. If perchance they are not equal the error must be traced. In any event, however, it receives further proof.

I will next refer to Forms 3 and 4, forming the right and left hand pages, respectively, of the "meters in stock," on the first of the month, and shows the number of each size, giving individual numbers and indices. The total of each size is carried out and the footing brought down as shown, and, as before stated, should agree with the similar statement made in the "meter change book."

Form 4, occupying the left page of the "inventory" book, makes three records, "meters in stock," "meters in use," and "meters owned by the company."

In filling out this page, beginning with "meters owned by the company," and referring to the "meter change" book (Form 2), the number of three-light meters will be the same as in the similar statement of the month previous, plus three-light meters bought and less those destroyed. The list is followed out in this way and footed. The "meters in stock" are brought over from the opposite "inventory" page, and the remaining list, "meters in use," is obtained by subtracting by sizes, the number "in stock" from those "owned by the company." A footing of "meters in use" should agree with the same statement in the "meter change" book, right page.

The next operation is the check-off for errors, either in the size, number or index of the individual meter, in the following manner: Begin with the first meter removed in the "meter change" book, and the same meter will be found either in the left page of the same book, as "set" or "in stock" of the "inventory," or among those destroyed. When found, check both, first noting that the size, number and index correspond.

After checking off all the meters in the right-hand page take the left-hand page and check into the "inventory" of the previous month. What meters now remain unchecked in the "inventory" of the previous month, should be checked either into the "inventory" of the present month or into those destroyed, shown on the right-hand page of the "change book," and if, after checking those "bought" into the present "inventory," all the work of the month is correct, every meter number will be check-marked; but any single error of an employe, either in reading the size, number or index of any meter during that month, either in setting, removing or in taking an inventory, will make itself apparent in this proving operation.

From the length of this description given it may be inferred that the whole system is a tedious affair; but not so. After a trial of five years I have not changed it in any particular and would not think of conducting my business without it. After perhaps an hour's time on the account, on the first of each month, I can rest assured that no meters have strayed away; that no errors have crept in to be carried into gas bills and cause complaint; that employes who have been careless are corrected; that I have a record of growth on file continally; that once a month is carried forward the number of each size of meters owned and in use.

The system as a whole and in its simplicity may perhaps be better understood than I may have been able to elucidate it, if the members, at their leisure, will perform the operation of check-marking the meters shown on the forms submitted, following out the explanation I herewith respectfully contribute.

Discussion.

The President—This is a very interesting paper, and worthy of discussion; but our hour for adjournment has arrived, and we will postpone the latter until the afternoon session. Immediately upon adjournment we shall meet in the lobby of the hotel, where General Hickenlooper will meet us, and from there conduct us to the Chamber of Commerce. It will be necessary for us to meet here promptly this afternoon in order to get through with our business. There are other papers to be read, and routine business may further trench upon our time.

The Convention then took a recess, until 2.30 P. M.

SECOND DAY—AFTERNOON SESSION.

Upon the return of the party from the reception at the Chamber of Commerce (which was notable for the pleasant greetings exchanged) the business of the second day was resumed.

The President—First in order will be the discussion on the paper, read the last thing this morning, by Mr. Hyde. He is ready to answer any questions on the subject. It is a question worthy of discussion.

Mr. Somerville—While I think that paper is very excellent, it is nevertheless one that cannot be discussed at length. His plan is most excellent in its arrangement. I think it will pay every gas company to adopt it. A young man, who not long ago took charge of a works, told me that in his early investigations at his post he found meters that were not down in the books at all—actually, they had no record of them. They had been put out, and to his surprise he found meters in places where he had no idea such instruments were. If an arrangement such as that proposed by Mr. Hyde had been in use at the start that would be an utter impossibility. I propose a cordial vote of thanks to Mr. Hyde for his valuable paper. [Adopted.]

The President explained that Mr. J. H. Woodmansee (Danville, Ills.), who hoped to have been present at the meeting, was obliged to remain at home, because of a business matter that developed at the last moment. The paper that he was to present, however, having been forwarded, at the President's request Mr. Scofield read the same, which was entitled

ON THE USE OF CRUDE OIL FOR ENRICHING COAL GAS AND FOR FIRING BENCH FURNACES.

I cannot hope to present anything new to the members of this Association, who are one and all so actively and eagerly seeking a solution of the problem of artificial illumination; nor can I expect to interest any but the few who may be situated as I am; in charge of small, illy-arranged works, with very limited means to experiment with.

When I took charge of the works of which I am superintendent they were like the western railroads in 1873, "A right of way and a streak of rust"—small and out f repair.

When the electric light came, gas from Illinois coal alone would not do. With cannel as an enricher we made a strong, yellow light of 17 to 18 candle power, which was objected to because it was not white enough. I finally tried crude oil as an enricher in a crude way with such appliances as I could find about the works. After several unsuccessful attempts I hit on the plan at present in use and am now sending out 22-candle gas, at less cost than the 18 candle gas with cannel as an enricher. It is hardly necessary to say that it is giving general satisfaction.

My plan is simply to introduce the oil by a pipe through the top of the mouth-piece. A street elbow screwed on the end of a pipe forms a hook on which to hang one end of a piece of old three-inch cast iron pipe, which is five or six feet long, the other end of which rests on the bottom of the retort. A ¾-nipple screwed into the side of the stand-pipe, with a meter cock on the outer end, serves as a tester. At first I would frequently have lamp-black instead of gas; I soon learned to avoid that, and, barring the occasional accidents of carelessness and negligence incident to retort house work, am now having very little trouble. I use about one gallon of oil to each thousand feet of gas made. I do not run the oil all the time, but begin at 9 or 10 o'clock A. M., and continue until the desired candle power is reached. When not running oil the three-inch pipe is taken out and the retort charged with coal. The plan and process may seem very crude and will not bear scientific scrutiny; nor will it recommend itself to those who can have something better; but to the small fry of our fraternity, who want something better than straight coal gas at little additional cost, I suggest a trial.

Much has been said and written about low heats and how to avoid the trouble they cause. It is easy to say build patented regenerative furnaces (some of which seem to require a scientific engineer to successfully run), but many of us can not do it, "you know," for want of means.

Coke from Illinois coal is not first-class for firing benches. To improve my heats if possible I tried crude oil, after reading the report of Prof. Douglas at the Chicago meeting, and have probably followed his plan, in part at least. Of course I had trouble and failure at first, never having seen an oil burner in use. I am using a burner of the annular pattern, with a jet of steam to spray the oil into the furnace. It is placed through the front wall, just above the firing door and about level with the bottom of the retorts. The oil flows by gravity from the storage tank to the burner and is regulated by a globe valve near the burner.

I have used oil as a fuel in two benches of 6's, most of the time for seven months past, with satisfactory results. With a consumption of fifty bushels of coke in each bench in twenty-four hours, I can carbonize 300 pounds of coal per retort in six hours, or 7,200 pounds per bench in twenty four hours. With a consumption of three barrels of oil (126 gallons) and fifteen bushels of coke in twenty-four hours, I can carbonize 300 pounds of coal per retort in four hours or 10,800, in twenty-four hours.

Other advantages are, that the labor is less, the heats are more uniform and the retorts last longer. With furnaces properly built no coke would probably be necessary. I use it to heat the air passing through the secondary air flues, which are built in the walls too low to be heated from the burning oil.

Oil costs, at our works, 63 cents per barrel. Coke sells readily at 8 cents per bushel. I estimate a saving of $1 per day on each bench, aside from greater service.

Discussion.

The President—You have heard the paper, and if anybody wants to catechise Mr. Scofield on his valuable paper (laughter) he is now ready for it.

Mr. Scofield—I read it as well as I could, if I did not write it.

Mr. Lansden—I move a vote of thanks to Mr. Woodmansee for writing the paper, and to Mr. Scofield for the intelligent way in which he read it. [Adopted.]

Mr. E. L. Brown—The writer says, "When not running oil the three-inch pipe is taken out and the retort charged with coal." What does that mean? Does it mean they do not use coal when they are using oil?

Mr. Scofield—I think they do not use coal when they use oil—that is, in the same retort. I have adopted similar methods.

(To be continued.)

Some of the Causes of Unaccounted-for Gas.

At the mid-May meeting of the Midland Association of Gas Managers Mr. W. T. Tew, of Warwick, presented the following interesting paper:

For a long time it had been my impression that the influences of temperature and pressure had a considerable effect upon the quantity of gas which is usually called "unaccounted-for" or "leakage;" and it was with the idea of ascertaining to what extent this influence prevailed, that the present paper was prepared. At the outset I may say that I am somewhat disappointed at not finding a greater difference than is apparent; but inasmuch as small matters are not to be despised, I take the liberty of placing my ideas on these points before you.

It is well known that heat exerts a great influence on gaseous bodies, causing them to expand at a uniform rate of $\frac{1}{491}$ of their bulk for each degree Fahrenheit; and it was in making the usual corrections for temperature and barometrical pressure that my attention was called to the possibility of the difference between gas made and gas sold being to some extent caused by the variations of temperature.

The temperature of the gas at the outlet of the station meter at my own works varies from 40°, in sharp weather in the winter, to 68° or 70° during very hot weather. It has never been below 40° for some years; but generally during a moderate winter the temperature is from 45° to 50°, the proximity of the purifiers to the meter being, as I think, one reason for the temperature of the gas being high. As the greatest consumption of gas goes on at the time when cold weather prevails, it is evident that should the consumer's meters be kept at a lower temperature than the station meter, the result must be that they would receive more gas to the cubic foot than was registered at the works. I regret that no opportunity has occurred of testing the temperature of consumers' meters, but, judging from the number which fall below 32° during a sharp frost, there is reason for assuming that a considerable proportion both of wet and dry meters are kept many degrees below the temperature which is maintained in the station meter. And when it is considered that a fall in the temperature of 5° at the consumers' meters involves a loss of approximately 1 per cent. of the quantity measured, and that in many cases the actual difference in severe weather is perhaps 10°, and that whilst this cold weather prevails the maximum consumption is going on under these adverse conditions, we are justified in assuming that an important factor in the calculation of unaccounted-for gas is to be found in the coldness of consumers' meters.

In justification of this view, let us consider the conditions under which meters are usually fixed. If a dry meter is the one to be put in, the practice is to put it anywhere out of the way. We are told that dry meters "won't freeze, you know;" and so if it is an open passage exposed to the direct influence of the N. E. wind, it does not matter, nothing will be affected by the situation. The meter will not stop working; but in such cases the consumer has the obvious advantage over the supplier of gas, as, for every foot of gas he consumes, the producer has to account for so much more that the difference in the temperature calls for. But should the meter be a wet one a little more care has to be exercised. It will freeze, and therefore must be placed in a warmer corner; and inasmuch as a fall has to be made from the pipes in the house, the favorite spot for the wet meter is known to be the cellar. Here, as a rule, the temperature is more regular than in a situation where a dry meter can be fixed with safety; but at best cellars are cold places; and I have no hesitation in asserting, as far as my experience goes, that most of the situations in cellars are at a lower temperature than the meter house at the works. I have also in my mind some important wet meters for the supply of public institutions which are fixed in small rooms specially erected for the purpose. During the winter the greatest care is necessary to prevent freezing, and the temperature is kept barely above 32°, whilst the gas at the works is being measured at 42°—entailing a loss of about 2 per cent. on the quantity supplied, and this to large consumers at the period of maximum consumption.

I may be reminded, as a set-off against this, that some meters are fixed in really warm places, where the conditions are such that a more favorable registration is induced. In the case of dry meters so situated there is, no doubt, an allowance to be made; but when wet meters are so placed the evaporation is increased so rapidly that the expansion in volume of the gas is counteracted by the lowness of the water line. Indeed, during the summer the large meters about which I spoke before, require weekly attention to keep their water line near the proper place. So that, taken with the fact that this occurs at the period of minimum consumption, it will not, in my opinion, do much towards reducing the loss caused by the effect of the colder weather.

The irregular consumption of public lamps is also a source of loss, as 0.1 cubic foot consumed in excess of 5 cubic feet per hour, should this quantity be stipulated, results in a loss of 2 per cent. on the quantity consumed.

Some time ago, when in conversation with Mr. Cross, of Leamington, on this subject, he mentioned the pressure of heavy holders as having a bearing upon this matter; and, after an investigation, I arrived at the following results. The pressure of a gasholder is equal, we will say, to 6 inches of water. This acts on the station meter with a pressure of 0.2171 pounds per square inch; being equal to an additional ¼-inch barometrical pressure. So that in using the table provided in various handbooks for correction for barometrical pressure and temperature, it is only necessary to add to the figures used for correction the sum of 0.017, and the adjustment for 6 inches pressure will be obtained. For example, supposing the holder contained 100,000 cubic feet of gas, at 30 in. Bar., and 60° F. (this being the standard condition of pressure and heat), the multiplier for correction would be 1. By adding 0.017 to this, and multiplying the 100,000 cubic feet, we have 101,700 as the actual quantity of gas in the holder, if relieved from all pressure, being 1¾ per cent. more than that registered in the station meter. Following this to its logical conclusion, we find that the leakage account should, in works where heavy gasholder pressure is used, be reduced to a low point, at the sacrifice of a certain quantity of gas per ton of coals used. It will be interesting to know if such is the case. If this inference is correct, large works should be more favorably situated than smaller ones, as respects loss by leakage, while making less gas per ton of coal.

The conclusions at which I think we may fairly arrive are that, under circumstances where the station meter is kept at a comparatively high temperature, the difference in the temperature of the consumer's and the station meter is a cause of an apparent loss of gas; and in cases where a low leakage account is the rule, accompanied by heavy gasholder pressure on the station meter, it is a question whether the former is not caused by the latter.

I have purposely refrained from making any remarks respecting actual leakage from defective mains, etc., not from ignorance of their importance, or of their much greater significance than the obscure causes at which I have hinted, but because I wished to confine your attention to those conditions which, as a rule, are not taken, and cannot be taken into account when making up the return for gas sales, but which, I trust, you will acknowledge exercise no inconsiderable influence on the mysterious leakage account, and will apparently dispel the hope of ever being able to account for the whole of the gas manufactured.

The Starting of the Dynamo-Electric Current.

A writer in *Annalen der Physik und Chemie* explains that a dynamo-electric current is a magneto-electric current which is reinforced by the mutual action of the current and the magnetic field. In order, therefore, that any dynamo-electric current may be started, there must be some residual magnetism to enable the machine to work as a magneto-electric machine.

It is, however, by no means true that any, however small, residual magnetism will give rise to a dynamo-electric current. The fact is, that it is essential that the speed should exceed a certain number of revolutions per minute; and this speed depends on the amount of the residual magnetism. There is thus for every machine a certain critical speed.

This statement may be verified by experiment. A machine is given the residual magnetism (r) by a current from some external source, and it is then driven at a speed n. If there is some kind of current meter in the circuit, it will indicate either the existence of a very weak current or the pointer will be driven far up the scale. In the former case n is less than the critical speed, in the latter, greater; in the former it is only a magneto-electric current which is set up, in the second it is true dynamo-electric current.

The experiments made by the author on a Gramme and a Siemens machine go to confirm the exactness of Clausius' theoretical deduction, that for slow speeds the machine gives no (dynamo-electric) current; but it first begins to work after having reached a certain speed. The two cases are, however, not exactly similar, as Clausius considered that the machine first began to run at a very slow speed, which gradually increased; while in the author's case the speed is always below the critical, so that no dynamo-electrical current will be produced, however long the machine is kept running.

The question may be looked at from another point of view. In the first instance, the residual magnetism (r) produces a magneto-electric current prn. This current produces a magnetic field $prn.q$, which again gives rise to a current $prn.q.pn$, and so on. The current can therefore be expressed by the infinite series:

$$i = prn(1 + pqn + (pqn)^2 + (pqn)^3 + \ldots).$$

This series is convergent or divergent, accordingly as n is less or greater than $1/pq$—*i. e.*, accordingly as n is equal to or greater than a certain value which is constant for the same machine. In the above series, q is not a constant, but a quantity into which r enters as a factor; hence it follows that the critical speed decreases with an increase of the residual magnetism—a conclusion which is confirmed by the experiments.

New Method of Estimating Temperatures.

MM. Nouel and Mesure, of Paris, have designed an ingenious (if small) instrument for reproducing high temperatures with accuracy, which the ordinary clay pyrometers at present in use are incapable of doing. The apparatus is based on the physical fact that heated bodies, such as iron, for instance, vary in color with their temperatures, passing from red through orange to dazzling white; and could the colors be reproduced with certainty they would show that the corresponding temperatures had been attained. The eye, owing to physical defects, is unable to properly distinguish these different shades, as a bar of iron which glows with a bright red in the dark room will appear dull in a well-lighted one. Messrs. Nouel and Messure's new pyrometer overcomes this difficulty, and registers the colors of varying temperatures with precision. It consists of a telescope fitted with a couple of Nicol's prisms, one of which acts as an analyzer to the other, a plate of quartz also being placed between the two. The light from a heated body is polarized on passing through the first prism, and the plane of this polarization is, as the light traverses the quartz plate, turned round through an angle proportional to the thickness of the quartz, and nearly inversely to the wave-length of the light—that is to say, in color. Hence, assuming that the prisms were set so that if the quartz were removed the polarized ray was quenched by the second, then, on replacing the quartz, the second prism would have to be rotated through a certain angle to again quench the light, this angle, of course, being equal to the rotation of the plane or polarization by the quartz, and, therefore, dependent on the color of the rays passing through. In practice, complete extinction never occurs; but at a certain point the color of the transmitted light changes from green to red, and this point is taken as the angle to be measured.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

It is announced that Messrs. Harbine and Millen, of the Xenia (O.) Gas Company, have purchased a controlling interest in the Xenia Electric Light and Power Company, which was organized in that city perhaps a year ago. The purchasers acquired the property under favorable terms, and will operate the same in conjunction with their well-managed gas plant. In the meantime the municipal electric lighting plant foisted on the city by its local rulers is yet in action, but so far, at least, this possession has not been thoroughly enjoyed by the taxpayers.

The absorption of the Troy (N. Y.) Gas Light Company by the Albany gas syndicate is now about completed; for probably not over 50 shares in the original capital are unidentified with the Benedict interest. In all probability the executive management to be shortly chosen will be as follows: President, Ed. Murphy, Jr.; Treasurer, S. O. Gleason; Secretary, John J. Cassin; Superintendent, Henry Shields. Important changes in manufacturing and distributing plant are under consideration.

Mr. A. Aubin has been named Assistant Gas Inspector for the Montreal district.

The proprietors of the fuel gas works at Jackson, Mich., are arranging for extensive additions to their plant.

We have it on pretty good authority that the proprietors of the Providence (R. I.) Gas Company intend to establish a water gas plant on their Public street property, South Providence. Mr. Slater has been sorely perplexed for the last two or three years to devise a means for relieving the old stations from the strain they have been put to in meeting the wants of the consumers, and the Public street scheme looks in line with good policy; for we presume that it will be used solely as an auxiliary. Another step that is to follow is a reduction in gas rates, which will probably be ordered to take effect from July 1st. We believe the rate is to be lowered to $1.40 per 1,000 cubic feet. At this figure gas cookers—which are now very largely used by the Providence housewife—will have a further boom in Slaterville.

Messrs. D. G. Cash, E. Brown, J. J. Fuller, W. Van Brunt, J. E. Marvin, W. E. Perry and E. E. Sherwood, have incorporated the Lakeside Light and Water Company, with a capital of $50,000. It is their intention to supply gas and electric light and water to the inhabitants of the district, and no time will be wasted in placing the necessary works.

The offices of the Rome (N. Y.) Gas Light Company have been removed to the local building known as the "American Block."

Supt. McCauley, of the West Chester (Pa.) Gas Light Company, reports that business increases quite noticeably, and that he is in good shape to meet the demands of the people for more gas light. This information, of course, is not in the nature of a surprise to those conversant with the West Chester Company's practice, which for some years has been based on liberal lines. For instance, the following is the schedule of charges for the current year. The rebate is granted at the end of the year:

Over	100,000	cu.	ft.	per	annum....	$1.50 per 1,000
"	50,000	"	"	"	....	1.60 "
"	10,000	"	"	"	....	1.80 "
Under	10,000	"	"	"	....	2.00 "

To those who prefer a stated contract, a special rate for a specified term and consumption is granted; and under this provision the Company now supplies gas to 25 services. Mr. McCauley's efforts in the line of introducing gas cookers have met with substantial success this season. And this statement reminds us that we have like reports from almost every State, although Ohio, Texas and New York (and in the order given) appear to be exceptionally favored in this direction. The practice at West Chester is to sell or furnish gas fixtures, burners, stoves and engines at cost.

MR. FRED. B. WHEELER has accepted an appointment to the Superintendency of the gas department of the Holyoke (Mass.) Water and Power Company. Presuming that this is the gentleman who was Mr. Nettleton's lieutenant at Birmingham, Conn., we must condole with Mr. N., while we congratulate Holyoke.

"TORONTO, June 1st, 1889:—*Mr. Editor:* I hand you an account of the fatuous action recently taken here by the local Board of Works and the City Council, in respect to the application made by the Consumers Gas Company, for the right to use the streets of the city in furtherance of its project to supply electric light under the Westinghouse system. When the Gas Company decided to install an electric plant, such decision naturally caused much disquiet among the local electricians, the latter knowing that the newcomer would, judging from the way in which its gas business had been managed in the past, render the best possible service at the lowest possible rates. Having determined to enter the field, application was made to the authorities, but the latter (much to the surprise of the applicants, and to not a small faction of the general public) seemed disinclined to grant the privileges asked for. The objections offered were of a most flimsy nature, the one perhaps most harped on being that the Gas Company, if allowed to take a hand in the contest for favor in the supply of electric lighting could take an unfair advantage over those now existing, in that it would devote its surplus earnings from its gas sales to cheapen its electric light supply, thus driving to the wall capital invested for promoting electric lighting pure and simple, and also rendering impossible future reductions in gas rates. Strange to say this owl-like argument had great force with the round-eyed reasoners who evolved it. So much for an introduction to the action of a few days ago. To be precise about it, a special session of the Board of Works was called for May 27th and in the belief that the Gas Company would present a communication at the session a large attendance was on hand to see the fun, and, as it transpired, to 'down' the Gas Company. One or two trivial matters having been disposed of, the President (Mr. Carlyle) announced that Dr. Larratt Smith and Messrs. Gooderham and Pearson, acting on behalf of the Consumers Gas Company, had placed a proposition before the Board. It was ordered read, and the following is a copy of it:

"'It having been urged by several members of your committee as an objection to granting permission to this Company to use the streets of the city for the purpose of introducing electric lighting by the Westinghouse system, that the Company would use its surplus earnings from the sale of gas for the purpose of cheapening the electric lighting, and thereby deprive gas consumers of the benefit of a reduction in the price of gas, we beg to say that this matter was brought before our Board of Directors, and they have instructed me to inform you that while protesting against the unfairness of the civic authorities in not allowing the Company to compete on equal terms with other companies in furnishing incandescent lighting to the citizens, yet, to meet the objection named, and to convince your committee that they were perfectly sincere in the statements made that they would not use the gas profits to cheapen the electric light, they will be willing—on the express condition of their being allowed to use the streets for the purpose of wiring the city—to reduce the price of gas consumed, after September 30 next (the end of the Company's financial year) as follows: They will reduce the present gross price from $2 to $1.50 per 1,000 feet, and allow a discount therefrom, for prompt payment, of 25 per cent., to all consumers of under 200,000 cubic feet per annum, thus reducing the price to them from $1.25 to $1.12½ net per 1,000 feet; and they will allow a rebate of 7½ cents per 1,000 feet at the end of each year to consumers of from 200,000 to 500,000 cubic feet per annum, reducing the price to them from $1.15 to $1.05 per 1,000, and a rebate of 10 cents per 1,000 to consumers of over 500,000 cubic feet per annum, thus reducing the net price to them from $1.10 to $1 per 1,000. The price of gas for gas stoves and engines will remain as at present, $1 per 1,000 cubic feet. On the estimated consumption of gas for next year these reductions will amount in all to the very large sum of $50,000. The Directors, therefore, trust that your committee, taking into consideration the fact that under the terms of their charter the Company could not be compelled to reduce the price of gas at all for several years to come, will consider this an entirely satisfactory guarantee that the gas consumers will in no respect suffer on account of the introduction by this Company of electric lighting, and they trust your committee will now have no hesitation in granting their petition without further delay.'"

"This proposition, or series of propositions, under which the Company agreed to give $50,000 per annum to the gas consumers of the city in return for the bare privilege of the use of the streets, rather staggered the opposition, which was far from prepared to listen to such a liberal offer. Mr. Shaw, however, managed to recover his breath in time to move that the offer of the Gas Company be held for further consideration, 'as being too important in its character to be lightly considered.' His speciousness was revealed when he followed that motion up by another, recommending that the report of the underground wire subcommittee (previously submitted to the Board), giving permission to the Toronto Incandescent Light Company, the Bell Telephone Company, and the Toronto Electric Light Company, to lay their conduits, be adopted. Mr. Baxter urged that as the gas company had met every objection by its last proposal, it should be allowed the privileges sought. The debate now became rather animated, and Mr. Shaw indulged in some remarks that undoubtedly will cause him food for reflection in the future that may not be pleasant. Personalities—even though partially garbed in innuendo—are poor arguments. The wordy warfare was terminated by Mr. Baxter in the presentation of an amendment (to the second Shaw resolution) to the effect 'That the Consumers Gas Company be placed on equal footing with the other companies, and that no action be taken on the Incandescent Light Company's application until the Committee had thoroughly considered the proposal from the gas company.' Even this temperate course was negatived by the Board, who adopted the Shaw resolutions as originally presented. Later in the evening the City Council ratified the action of the Board of Works, and thus the matter stands. Public sentiment is all against the stand taken, and I feel that I am right in predicting that Shaw and his confreres will soon be compelled to account for their (to say the least) peculiar methods of benefitting the artificial lighting consumers of Toronto. In conclusion, and not without some hesitation, do I write the query: I would like to know how it is that such clear-headed men as those in charge of the Consumers Gas Company have ever shown themselves to be can figure out a profit in engaging in incandescent electric lighting—particularly so when the ordinary gas consumer is assured of a gas supply at the rate of $1.12½ per 1,000. In my opinion incandescent electric lighting is sure to be a failure here with the public for at least 8 months in the year. Toronto is too far north for the light of the future, especially when in competition with really good and certainly cheap gas.—DOMINION."

A SPECIAL election was held in Slater, Mo., for the purpose of determining whether the city should issue bonds to the amount of $14,500, the proceeds to be devoted to the purchase of the electric light plant installed there a few months ago by Messrs. Cowl, Vandenberg & Co. The vote was, "No," 137; "Yes," 36.

MR. W. L. COLE, Secretary of the Rochester (N. Y.) Municipal Gas Company, has been appointed Manager of the Rochester Gas Company, vice Matt Cartwright, resigned. The Municipal's offices are now in the headquarters of the old Company.

DURING the recent disastrous freshets in Pennsylvania and Virginia Fredericksburg came in for its portion. Along with the rest of its miseries the city was without light for some nights, the rising waters having shut off both the gas and electric supply.

SOME time ago the proprietors of the Saratoga (N. Y.) Gas and Electric Light Company determined to try the storage battery system for the supply of incandescent electric lights. After a fair trial the system has been discarded, to be replaced by the direct plan of distribution. Reasons for the change, inefficient service and high cost.

MR. LOUIS MALM, who resigned from the Superintendency of the Marblehead (Mass.) Gas Company to take service with the Standard Oil Company, is to be succeeded at Marblehead by Mr. C. R. Dinsmore, formerly in charge at Danvers, Mass.

WE regret to record the death of Mrs. David Boynton, late the estimable wife of Mr. David Boynton, Superintendent of the Chicopee (Mass.) Gas Company. She had been ill for several weeks.

THE authorities of Hyde Park (Chicago, Ills.) have notified the Hyde Park Gas Company that the contract under which the latter lights the streets will be abrogated on July 1st. In the meantime the powers that be will advertise for bids for lighting for a year from that date. Figures will be obtained for gas, electricity and oil.

MR. HOMER A. ROSE, of Buffalo, N. Y., having purchased a controlling interest in the Medina (N. Y.) Gas Light Company, from Mr. R. H. Stranahan, the latter will retire from the Presidency.

ADVICES from Newport (R. I.), dated May 31, are to the effect that the petition of J. Edward Addicks and others to the Rhode Island Legis-

lature for an act to incorporate the Rhode Island Gas Company, with a capital of $5,000,000, was indefinitely postponed. The act met with general opposition on the ground that the petitioners were not engaged in a *bona fide* enterprise, but were simply seeking to obtain the charter as a menace to the existing gas companies of the State.

SUPT. TRACY, of the Peru (Ind.) American Gas Company, is again before the gas consumers of that city with an appeal for their suffrages in the shape of a decided concession in selling rates. The gross price is fixed at $2 per 1,000, and prompt payment (*i.e.*, within 10 days from presentation of bills) brings the following discounts into play:

Monthly Consumption.	Discount.	Net, per 1,000.
500 to 1,000 cu. ft.....	10 per cent.....	$1.80
1,000 to 10,000 cu. ft.....	25 "	1.50

Those who use over 25,000 cubic feet per month are entitled to a special contract rate. There can be no doubt about it that those in control of the plants operated under the general protection of the American Gas Company are up to the times in every respect; and Superintendent Tracy seems to be the right man for Peru. In fact, he would be the right man for a much more populous place.

ON the 1st of the month Messrs. W. A. Wood, T. A. Cheeney (Little Falls), W. P. Warren, C. W. Tillinghast and C. E. D. Tibbits, of Troy, filed articles incorporating the Hoosic Falls (N. Y.) Gas Company. The capital stock is returned at $30,000.

SOME of the ladies of Grand Rapids, Mich., have rendered good aid to charity in the establishment and maintenance of a Union Benevolent Home in that city. Not only are the homeless cared for, but a department is operated in which the necessary tuition for the training of skilled nurses is given. Not long since the managers determined to add to the completeness of the education of these watchers of the sick by adding a course in practical instruction for preparing food for patients. At this juncture the Grand Rapids Gas Company offered to assist in this laudable plan, by furnishing the Union with a large and handsome gas range. The offer was gladly accepted, and now not only are the nurses taught how to cook by gas, but a large portion of the general cooking of the home is performed by the same agency.

THE Pottstown (Pa.) Gas and Water Company has decided to increase its capital stock from $90,000 to $225,000. The money will be expended on the water works division of the enterprise, which branch of its business is rapidly extending.

THE Middletown (N. Y.) Gas and Electric Light Company is making large additions to its main system; and when this work shall have been completed, Superintendent Todd will begin to think that the worst of his trouble is over. He has had a busy time of it since leaving Natick, Mass.

THE measure introduced in the Omaha (Neb.) Council, by Ald. Davis, under which it was sought to compel the local gas company to sell gas at the rate of $1.50 per 1,000, was rejected. The current rate is $2, with 12½ per cent. off for prompt payment.

THE Council of Williamsport (Pa.), on the Wednesday evening preceding the fateful and fatal flood of Friday, May 31, agreed to award to Messrs. Garhart & Rhoads a contract for the public lighting, by means of arc lamps, the leading features of the arrangement being as follows: The contractors are to furnish 170 arcs (2,000 candle power each), of the Westinghouse type; the lights are to be turned on at dusk, to be extinguished at daylight, and to be kept in duty each night and all night; the contract is to last for 5 years; the price agreed upon is, first year, $14,280; second year, $14,110; third year, $13,600; fourth year, $13,090; fifth year, $12,835; the city reserves the right to, at any time within 4 years from the date of the contract, upon giving 3 months' notification of such intention, to purchase the entire plant, etc.; the contractors agree to furnish additional lamps at the rate of $80 each per annum; the payments for the service are to be made monthly, the contractors, however, to consent to allow monthly deductions for any lamps that may not be used.

THE purposes of the proprietors of the Queen City Natural Gas and Fuel Company, who propose to distribute natural gas for fuel in Cincinnati, Ohio, are but poorly disguised in the wording of the ordinance submitted by them to the Board of Public Affairs. The scheme in fact is betrayed in the first section of the asked-for ordinance; at least we were inclined to think so from reading the following clause: "The name and words 'The Queen City Natural Gas and Fuel Company,' as used in this ordinance, shall apply to and include said corporation, its successors and assigns; the words 'fuel gas,' as used herein, are intended to mean and embrace natural gas and gas manufactured from petroleum." The wood in that pile is hardly high enough to conceal the joker. Gen. Hickenlooper, however, has looked into such heaps before.

IN December, 1887, D. O. Taylor, of West Chester, Pa., lost his life through a boiler explosion in the plant of the local Edison Lighting Company. His widow brought suit against the Company, asking damages in the sum of $10,000; but subsequently compromised it for a cash payment of $500.

ON May 29th, the backers of the Hartford (Conn.) Light and Power Company appealed to the lower branch of the Connecticut Legislature for the right that had been denied them in the upper house; the proceedings in respect to the latter struggle having been fully detailed in these columns by our correspondent "Haddam." They met with better success in their last attempt, in that they succeeded in securing an affirmative vote. A local paper in reporting the case says: "The Company was willing to accept almost any sort of an amendment, good, bad, or indifferent. The original resolution is, in fact, so plastered as to be virtually a new one, yet those interested seemed pleased and elated over what they claim is a victory due solely to eloquence of persuasion. Under the amendments the Company is restricted to certain territory; it cannot locate its works in a neighborhood where adjacent property holders make objection, and in the event of using the plant of the steam heating company just compensation must be made." We fail to see how this consent can benefit the Light and Power Company; for if the Senate refuses to concur—and there is every likelihood of such refusal—the House resolution amounts to nothing.

THE day fixed by the Board of Public Works (Cincinnati, O.) for a special hearing in the matter of the proposed ordinance for the Queen City Natural Gas and Fuel Company is June 13.

THE proprietors of the Atlantic City (N. J.) Gas, Water and Electric Light Company are to be congratulated on the enterprising way in which their property is managed. Perhaps the highest candle power gas in the State is supplied, and not a hotelkeeper (we believe there are 120 hotels in the city) ventures a word about the quantity and quality of gas, save in the way of praise. The Company has recently installed a 50-horse power Otto gas engine in its electric annex, and it is said to give complete satisfaction. Should the ultimate verdict be in accordance with the present opinion, the entire motor power needed (about 200 horse) will be supplied by gas engines. The Thomson-Houston system of electric lighting is followed.

The proprietors of the Waltham (Mass.) Gas Light Company positively deny that negotiations are in progress looking to its absorption by the Bay State Company. They admit, however, that a proposition to that effect was made them, but that it was rejected.

IT is expected that the new plant at Amherst, Mass., will be in complete working order by July 1.

A QUEER story, via Brother McCauley's bailiwick, at West Chester, Pa., is to the effect that he has issued a mandate that is intended to break up a tramps' resting place. The warm hospitalities of the engine house were not denied those nomads during the winter season, nor perhaps would a change have been ordered this spring but for the fact that the disappearance of a barrel of alcohol had been traced to these lodgers of many a clime. The barrel in question was located in a room adjoining that in which the wanderers slept. After much prospecting they finally succeeded in making connection with the bunghole (using a small gas pipe as a service) through the thin board partition that separated them from the latter. Then all was easy. They also substituted water for the alcohol used in the workmen's lamps.

BROTHER ENFIELD has had some betterment work laid out this season for the Dallas City Gas Light Company. The schedule includes a two-lift telescopic holder, with a capacity of 110,000 cubic feet; a new bench of 6's, and considerable main extensions—about one mile of 6-inch, one mile of 4-inch, and some 3-inch. The iron work will be put up by the Stacey Manufacturing Company. The Company's electric annex is equal to the maintenance of 90 arcs and 1,000 incandescents. Dallas grows with great rapidity; but Enfield and the Dallas City Gas Light Company are keeping right up with the procession.

On the afternoon of the 30th ult. the fuel gas plant connected with the works of the Addyston Pipe and Steel Company, was destroyed by fire. The loss is put at $20,000. The plant destroyed was of the Loomis type, and was constructed in 1887. Its capacity was 150,000 cubic feet per diem.

The Committee on Incorporations, Connecticut Legislature, has made an adverse report on the petition of certain parties for a charter for the Peoples Gas Light Company, which it was proposed to operate in opposition to the existing Danbury Gas and Electric Light Company. This is a wise determination.

A fortnight ago we announced that the Malden and Melrose (Mass.) Gas Light Company would offer at auction a block of 500 shares of new stock, and, premising the prediction with the remark that the highest hitherto recorded price for shares in this Company was 108½, suggested that 115 would be a pretty good figure for the new issue to bring. We were all wrong, however, for the stock was sold at 125½. This shows about as well as anything can show that investors are in no wise timid over the future of the light of the present.

A Philadelphian (James W. Pittinos) has been trying to convince Director Wagner that under the Pittinos gas process 7.20 cubic feet of gas can be made from a pound of coal. Of course, the candle power is also of a very high grade.

Another "Waste Product" Put to Use.

One of the greatest difficulties with which oil and gas operators are confronted in their search for the products noted is the all too frequent presence of salt water, which often comes into a well while drilling, rendering it worthless and a dead loss; or, if the well escapes then, an extra demand upon its capacity will bring in the salt water so strongly as to destroy its usefulness for oil and gas purposes. There has never been any way discovered whereby this difficulty could be obviated, but within the past few months experiments have been prosecuted in Findlay by a Company, of which Capt. Shank, an old salt manufacturer, is the head, which demonstrate successfully the fact that this salt water, which comes into the wells with such force that it flows out of the top of the casing as freely as gas, can be utilized in the manufacture of a most excellent quality of salt.

The Company, which is known as the Findlay Salt Manufacturing Company, last fall purchased two well known gas wells which had been abandoned on account of the immense quantity of salt water which came into them, rendering them absolutely worthless for gas purposes, and began a series of experiments with machinery of a new design and under a new process, whereby it has been enabled to produce table and commercial salt of fine character and excellent savor, and at a cost which enables the Company to compete successfully with any salt manufacturing institution in the country. The process under which this Company experimented and is now working is as yet a secret, and belongs exclusively to this Findlay organization. It is at present engaged in erecting extensive works, and is backed by an immense capital.

The Company proposes going into the business on a large scale, and as it can drill anywhere in the gas field and be assured of a large supply of salt water, which flows to the top of the ground as freely as a mountain stream seeks its level, it apprehends no difficulty in prosecuting its operations. It is, also, the purpose of the Company to purchase all the oil and gas wells which are affected by salt water, and pipe the fluid to its refinery in Findlay, the same as gas and crude petroleum are now handled. This new and novel industry is already attracting much attention, because of the possibilities which it opens to those who are engaged in the oil and gas business of securing a profitable market for whatever the drill may find, be it oil, gas, or salt water. Heretofore the presence of salt water indicated nothing but a dead loss to those drilling for oil and gas, but with a demand for salt water the aspect of things changes, and the oil and gas operators of Ohio will be large gainers from the discovery.

Progress in the German Gas Industry.

The following particulars (taken from the thirty-fourth annual report of the German Continental Gas Company) go to prove that our German brethren have not suffered from the competition with electricity. The Directors (the report covers the year ended Dec. 31, 1888) say:

The commercial year 1888 was, on the whole, more favorable to the German gas industry than the preceding year; for, owing to the increased activity in almost all other industries, the demand for gas also increased considerably. Uufortunately, however, the reverse was the case in the foreign establishments owned by the Company; and therefore the total result is a small but very inconsiderable increase in consumption. The progress of the work of development was more satisfactory; and the most favorable sign for the future business of the Company is the extraordinary increase in the number of lights, through the introduction of new and the enlargement of old distributing plant. During the whole 33 years of the existence of the Company there has never been an increase even to approach it.

At the Company's central works the gas meter department turned out 1,576 new meters, and repaired 258 last year, as against 1,444 new ones and 444 repaired in 1887. The department for heating and cooking apparatus developed considerably; 43 workmen being employed therein at the close of the year. The articles manufactured, especially all kinds of cooking and heating stoves, gas ovens, etc., have become more extensively known, and will aid substantially the extension of the consumption of gas. There were 897 gas irons and 3,145 gas stoves of different kinds and sizes manufactured. This department of the Company's operations could not be expected to pay the first year, owing to the exceptional expenditure on new apparatus and models, on exhibitions, and on prospectuses, advertisements, etc.; but at the present time (March, 1889) it is yielding a profit. The building and working capital for both departments of the central works was at the close of last year, 223,193.99 marks, and the profit amounted to 10,437.16 marks, or 4.68 per cent.

The insurance fund rose to 138,512.20 marks last year, and there was not any withdrawn. The disbursements for pensions, gratuities, insurance against accidents, sickness, etc., amounted to 57,496.56 marks, as compared with 38,714.31 marks in 1887. The officers' pension fund rose from 164,711.51 to 199,656.70 marks. Owing to the vigilance and care of the Company's employees there were no accidents in working, nor any exceptional losses.

The consumption of gas during the year 1888 was as follows:

	Cubic Meters.		Per Cent.
Street lighting	5,397,804	or	19.01
Public buildings	2,185,790	"	7.70
Private houses	11,014,425	"	38.79
Industrial purposes	7,481,028	"	26.34
Heating purposes—			
Gas engines 1,309,638			
Stoves, etc..... 1,007,391			
	2,317,029		8.16
Total	28,396,076		100.00

Under the head "Industrial purposes," railways, cotton industries and iron and steel works consumed respectively 2,364,571, 1,665,530, and 1,058,424 cubic meters. The falling off in the private consumption in Warsaw, Hagen and Lemberg, amounted to 611,851 cubic meters; moreover, public buildings have used 80,521 cubic meters less. But against this there was an increased consumption of 284,484 cubic meters in factories, of 318,056 cubic meters in street lighting, and of 374,575 cubic meters for heating and motive power; making a total increased consumption of 284,743 cubic meters. It is noteworthy that the consumption of gas for heating and motive power rose from 6.9 per cent. of the total in 1887, to 8.16 per cent. of the total in 1888—an increase which puts the effect of electric competition quite in the shade. At present there are 378 gas engines in use, representing 1,332-horse power, against 329, representing 1,133-horse power, at the close of 1887.

Recent Patent Issues.

The following list of recent patents relating to the gas interests is specially reported by Franklin H. Hough, solicitor of American and foreign patents, 925 F street, N. W., Washington, D. C.

Issue of May 21, 1889.

403,508. Gas or Lamp Bracket. W. and J. Boekel, Rochester, N. Y.
403,612. Gas Burner and Heater. D. S. Robiliard, Quebec, Canada.
403,803. Gas, Incandescent. C. A. von Welsbach, Austria.
403,804. Gas, Incandescent. C. A. von Welsbach, Austria.
403,874. Smoke and Gas Consuming Furnace. J. Burns, Rochester, N. Y.

Issue of May 28, 1889.

403,920. Apparatus for Manufacturing Gas. G. K. Cummings, Philadelphia, Pa.
403,921. Gas Manufacturing. G. K. Cummings, Philadelphia, Pa.
403,944. Gas-Lighter, Electric. J. H. Lehman, Philadelphia, Pa.
404,205, 404,206, 404,207, 404,208, 404,209. Gas Manufacturing. B. Loomis, Hartford, Conn.
404,322. Apparatus for Producing Gas. R. R. Turner, Columbus, O.

The Market for Gas Securities.

Consolidated is rated at 89, ex-div., and it is cheap at that. During the week there was a fairly good demand for other city shares, and buyers conceded something to the ideas of value entertained by holders. Mutual in particular was sought for at an advance of three points over last week's bid figure. Five shares of Mutual were sold at auction at 104¾; $1,000, same Company's 6 per cent. bonds, brought 101¼. The inquiry for Standard preferred still continues.

Through a mistake in last week's issue Central, of New York, is quoted at 80-92½. The figures should apply to Central, of San Francisco, Cal. The former remains as before, at 70 to 80.

Brooklyn shares are strong and higher, old Brooklyn, Williamsburgh and Fulton-Municipal taking the lead, while the Peoples also shared in the advance. Among the auction sales of Brooklyn securities we note: $8,000 Williamsburgh first mortgage sixes, at 110½; and 24 shares stock, same Company, at 122¾.

In out-of-town shares we report an improvement to 61½ in Chicago Trusts. A dividend of 2 per cent. has been declared on these shares, payable June 20, to stockholders of record of June 10. The transfer books in New York, Chicago and Philadelphia will close to-day and reopen on the 21st. The dividend checks will be mailed from the Chicago office. The St. Louis deal has been perfected. The management is as follows: President, Emerson Mc Millin; Vice-President, Chas. Gibson; Secretary, J. D. Thompson; Directors, the officers and Samuel Simmons, L. H. Cohn, Wm. Nichols, and T. B. Porter.

We are sorry to see Messrs. Keiser and Mitchell outside of the posts they filled so well. It might also be noted that Mr. Geo. T. Thompson and Geo. Shepard Page—the latter was one of the prime movers in the consolidation of the St. Louis gas interests—arrived safely in Europe on the 6th inst. The Central New York speculators have secured a franchise for Oswego, N. Y., and already have one for Watertown, N. Y. They do not mean to build.

Gas Stocks.

Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks.

16 Wall St., New York City.

June 10.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

	Capital.	Par.	Bid	Asked
Consolidated	$35,430,000	100	89	—
Central	500,000	50	—	—
" Scrip	220,000	—	—	—
Equitable	4,000,000	100	125	—
" Bonds	1,000,000	—	113	115
Harlem, Bonds	170,000	—	—	—
Metropolitan, Bonds	658,000	—	116	118
Mutual	3,500,000	100	105	106
" Bonds	1,500,000	—	100	102
Municipal, Bonds	750,000		—	—
Northern	125,000	50	39	—
" Scrip	108,000			
Yonkers		50	90	100
Richmond Co., S. I.	346,000	50	—	—
" Bonds	20,000	—	—	—
Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	105	107
Citizens	1,200,000	20	65	70
" S. F. Bonds	320,000	1000	—	103
Fulton Municipal	3,000,000	100	125	128
" Bonds	300,000		—	106
Peoples	1,000,000	10	72	75
" Bonds (5's)	368,000	—	97	—
" " (6's)	94,000	—	100	—
Metropolitan	1,000,000	100	88	90
Nassau	1,000,000	25	111	113
" Ctfs	700,000	1000	100	103
Williamsburgh	1,000,000	50	119	122
" Bonds	1,000,000	—	109	112

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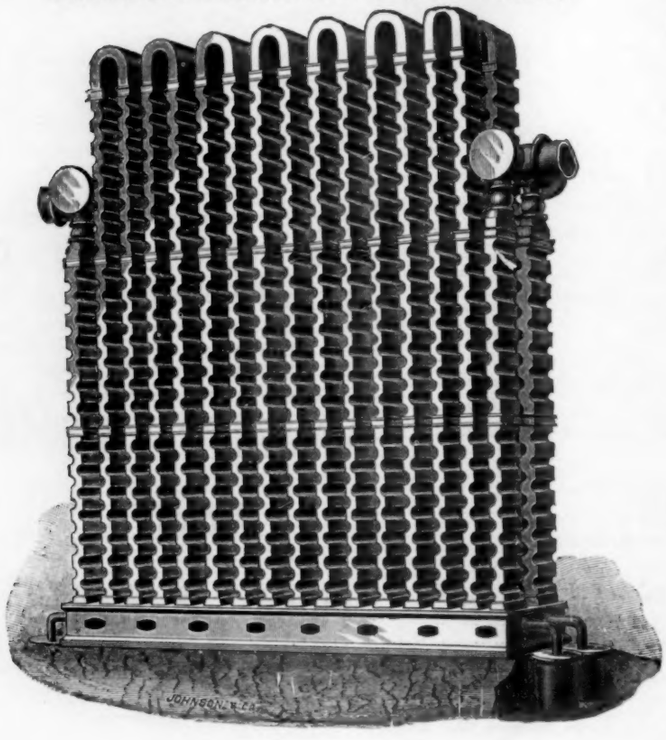

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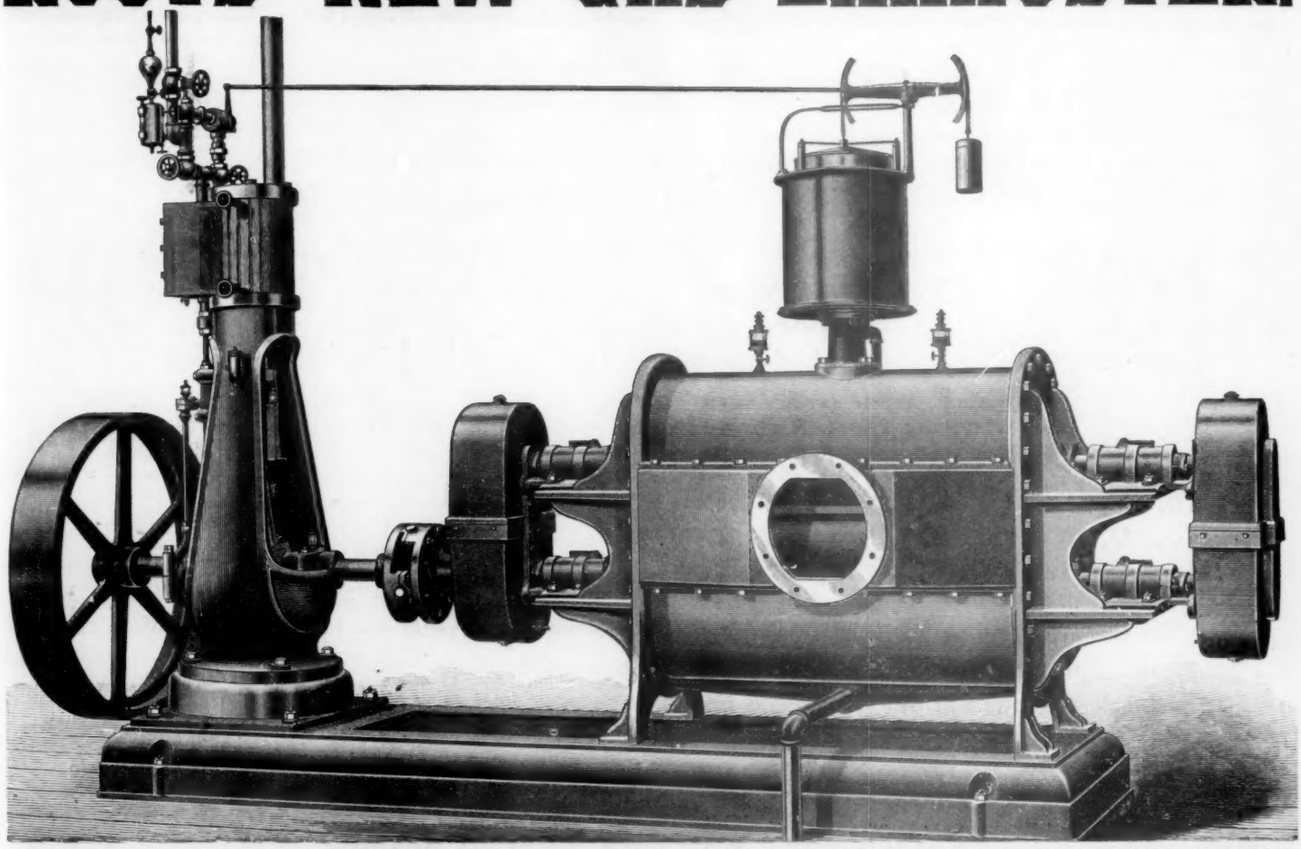

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A very general demand exists, in both large and small Gas Works, for an apparatus that will be absolutely efficient in the removal of the tar which passes the hydraulic main and condenser. Many attempts have been made to accomplish this, but, I believe, without success, until the introduction, five years ago, in England, of the C. & W. Walker Patent Tar and Carbonic Acid Extractor. During these years this apparatus has been adopted by many of the most prominent Engineers, not only in England, but also on the Continent of Europe and in other parts of the world. It is only necessary to give here a partial list in order to convince any intelligent American Gas Engineer that this machine must have succeeded fully in accomplishing the desired results.

The following Engineers have personally given permission to refer to them:

G. C. Trewby, Esq., Engineer-in-Chief of the Gas Light and Coke Co., London. The manufacturing plant at Beckton is built in complete sections of 3,000,000 cubic feet capacity each. A Walker Tar Extractor has been fitted to each one of these sections. This was done after a long and thorough trial on one of its sections. The Tar Extractor has been supplied to other works of the Gas Light and Coke Co., including those of which John Methven, Engineer of the Gas Light and Coke Co. at the Nine Elms Station, is in charge. Also to G. E. Stevenson, Peterborough Gas Works; B. Green, Mitcham and Wimbledon Gas Works; W. H. Smith, Bedford Gas Works; F. Linging, Norwich Gas Works; J. T. Browning, Colchester Gas Works; S. B. Darwin, Portsmouth Gas Works; J. McCrae, Dundee Gas Works; W. J. Wells, Stamford Gas Works; J. M. Darwin, Longton Gas Works; J. Paterson, Warrington Gas Works; and J. Coulter, of the Dundalk Gas Works. All of the foregoing gas works are located in Great Britain.

Mr. Charles A. Gerdenier, Superintendent of the Bridgeport (Conn.) Gas Light Company, writes as follows, under date of Dec. 3, 1887:

"The C. & W. Walker Tar and Carbonic Acid Extractor has been in operation at these works for the past six weeks, and is an unqualified success. It removes every particle of Tar from the gas in once passing through the apparatus, and a large percentage of the Carbonic Acid. I also feel quite sure that it prevents the formation and deposit of Naphthaline, because since I started the Washer I have had no stoppages from this cause. These works have been seriously troubled with Tar for many years, and I have used several kinds of apparatus and every expedient which has come to my attention for dealing with the difficulty, but without success. The Walker apparatus occupies comparatively small space, is less expensive than other systems, and requires but little attention. I carry 2½-inch seal, and have an automatic tar delivery valve. This Tar Extractor is indispensable to gas makers."

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No. 3,	"	"	250,000	"	"	"	5	"	"	" "
No. 4,	"	"	500,000	"	"	"	6	"	"	" "
No. 5,	"	"	750,000	"	"	"	7	"	"	" "
No. 6,	"	"	1,000,000	"	"	"	8	"	"	" "
No. 7,	"	"	1,250,000	"	"	"	9	"	"	" "
No. 8,	"	"	1,500,000	"	"	"	10	"	"	" "
No. 9,	"	"	2,000,000	"	"	"	12	"	"	" "
No. 10,	"	"	3,000,000	"	"	"	15	"	"	" "

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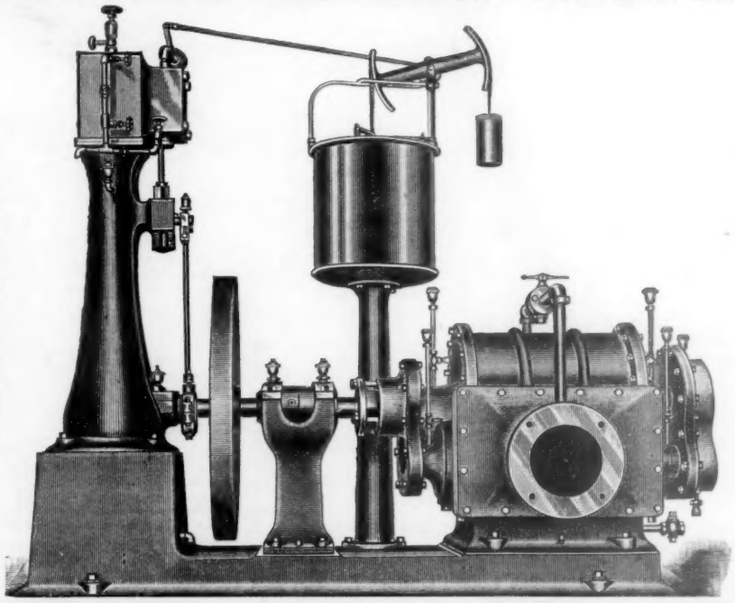

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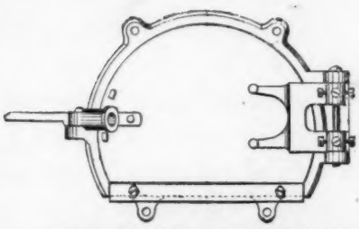

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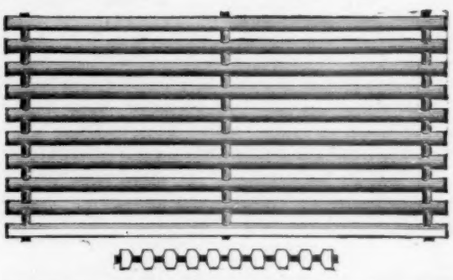

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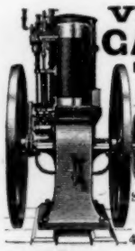

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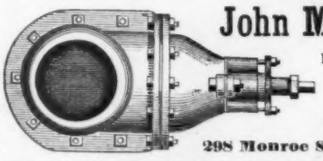

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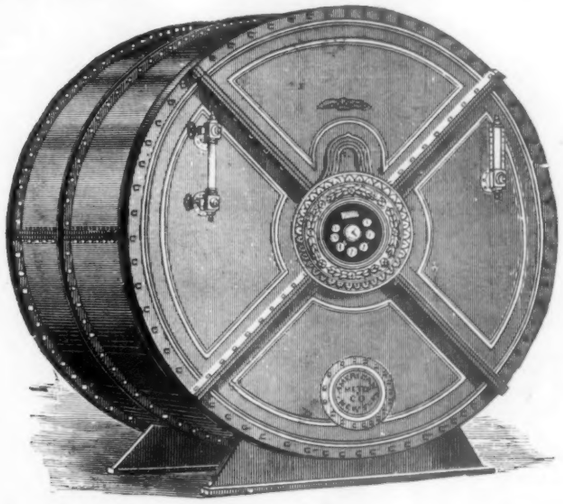

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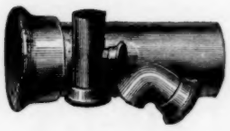

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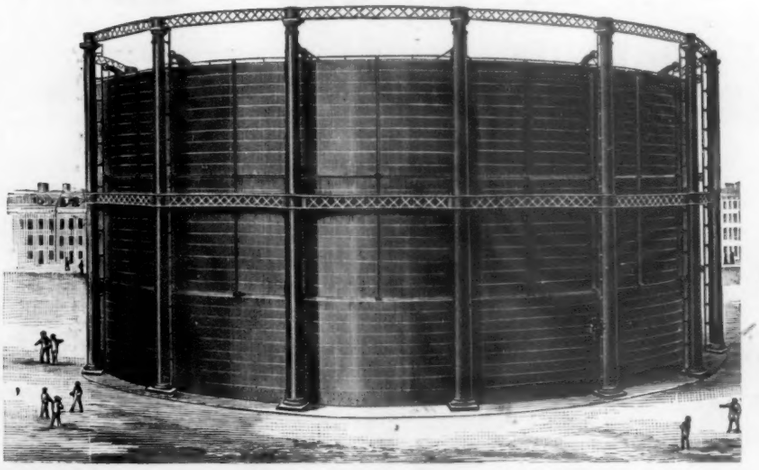

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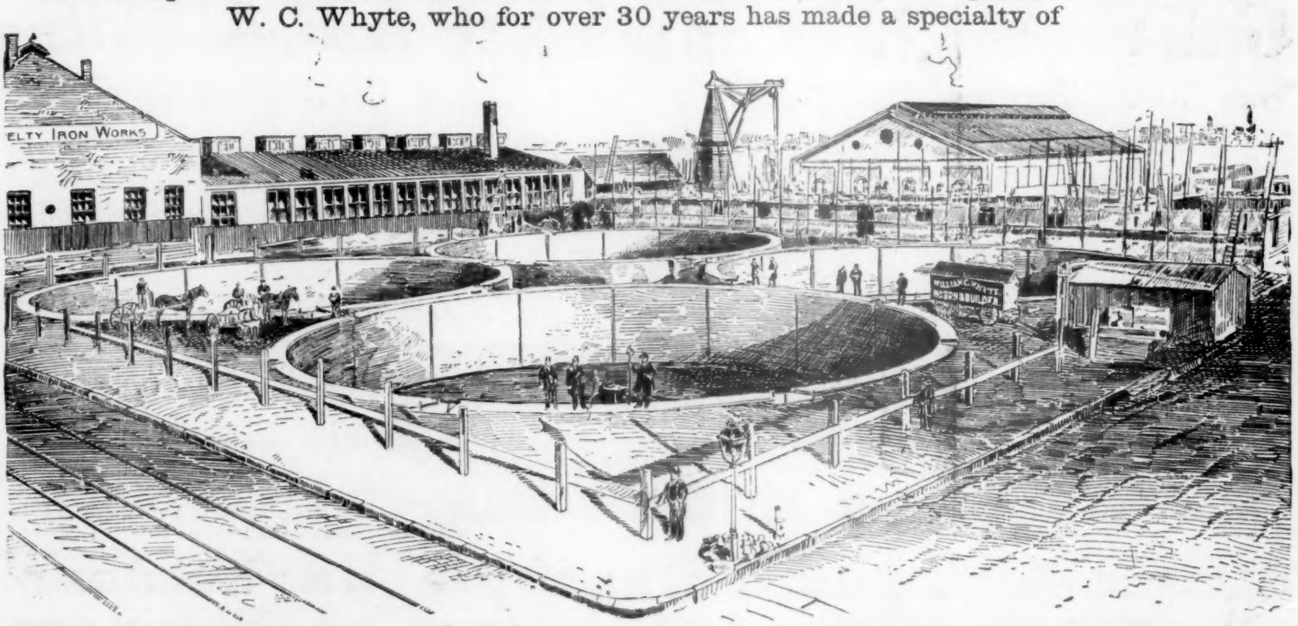

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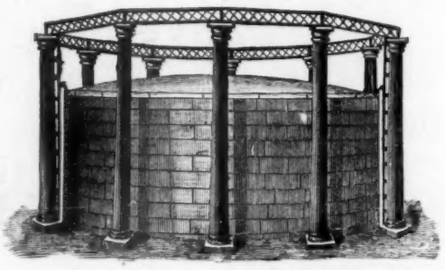

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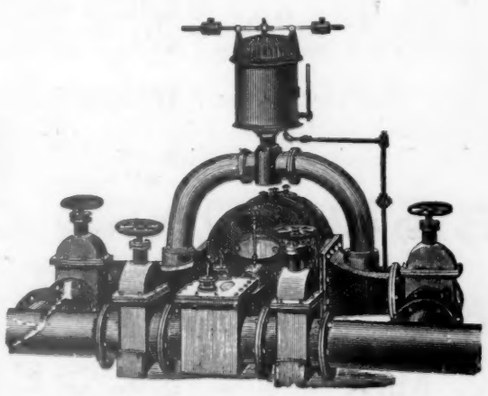

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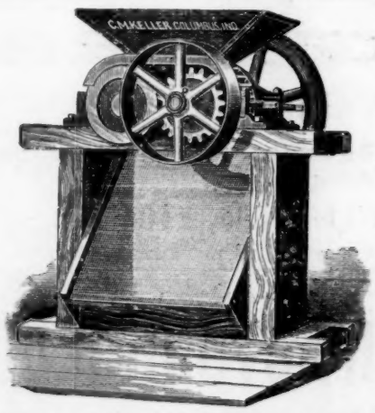

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WET AND DRY GAS METERS, STATION METERS, EXPERIMENTAL METERS, METER PROVERS,

Center Seals, Pressure Registers, Governors, Indicators, Photometers, and all other kinds of Apparatus for use in Gas Works.

FOULIS' PATENT STATION AND DISTRICT GOVERNORS.

REPAIRING DEPARTMENT.—We employ a special force of skilled workmen repairing meters of **all makers.**

WM. WALLACE GOODWIN, Prest. and Treas. WM. H. MERRICK, V.-Prest. S. L. JONES, Sec. S. V. MERRICK, Supt.

THE GOODWIN GAS STOVE AND METER COMPANY.

Successors to W. W. GOODWIN & CO.

1012, 1014 and 1016 Filbert St., Phila., Pa. *142 Chambers St., New York*
76 Dearborn St., Chicago, Ill.

WALDO BROS., Agents, 88 Water St., Boston.

MANUFACTURERS OF THE "SUN DIAL" GAS STOVES, FOR COOKING AND HEATING PURPOSES.

Dry and Wet GAS METERS, Station Meters (Square, Cylindrical or in Staves) Glazed Meters, King's and Sugg's Experimental Meters, Lamp Post Meters, Etc., Etc., Meter Provers (sizes 2, 5 and 10 feet), Pressure Guages of all kinds, Pressure Registers, Pressure and Vacuum Registers, Pressure Indicators (sizes 4 inch, 6 inch and 9 inch), King's Pressure and Vacuum Gauges, Dry and Wet Centre Seals, Dry and Wet Governors, Exhauster Governors, Photometers of all descriptions. Letheby's Sulphur and Ammonia Test Apparatus complete—also Testing and Chemical Apparatus of all kinds, and of the most perfect description, for all purposes relating to Gas.

GOODWIN'S IMPROVED LOWE'S JET PHOTOMETER.

Agents for Bray's Patent Gas Burners and Lanterns.

Special attention to repairs of Meters, and all apparatus connected with the business.
All work guaranteed first class in every particular, and orders filled promptly.

G. B. EDWARDS, Mang'r, New York
S. S. STRATTON, Mangr. Chicago.

D. McDONALD & CO.,

GAS METER MANUFACTURERS.

(Established 1854.)

51 Lancaster St., Albany, N. Y. 34 & 36 West Monroe St., Chicago, Ill.

STATION METERS, EXPERIMENTAL METERS, METER PROVERS, PRESSURE & VACUUM REGISTERS, PRESSURE GAUGES, ETC.

Also STAR GAS STOVES, RANGES, and HEATING STOVES.

We use only the very best materials, and employ the most skilled labor, and by our long experience (32 years) and personal supervision of every detail, we feel justified in assuring the public that our goods will give perfect satisfaction. Every Meter emanating from our establishment will bear the State Inspector Badge, and will be fully warranted by us. Our Annual and Calendar will be sent to Gas Companies upon application.

GAS STOVES. GAS STOVES. GAS STOVES.

THE GOODWIN GAS STOVE AND METER CO.,

1012-18 Filbert St., Phila., 142 Chambers St., N. Y., 76 Dearborn St., Chicago.

Agents, WALDO BROTHERS, 88 Water Street, Boston.

WM. W. GOODWIN, Pres. and Treas.
W. H. MERRICK, Vice-Pres.
S. LEWIS JONES, Sec.

SAMUEL V. MERRICK, Supt.
G. B. EDWARDS, Mang'r, N. Y.
S. S. STRATTON, Mang'r, Chicago.

SOLE MANUFACTURERS OF THE

"SUN DIAL" GAS STOVES,

The Most Economical, Efficient, and Durable Gas Stove Made.

GAS COOKING STOVE, No. 8 C.

SIZE.

Stove.	Oven.	Roaster.	Top.	Length over Extension Shelves,
37 in. high.	12 in. high.	12 in. high.	24 in. long.	36 in.
20 in. wide.	17½ in. wide.	18 in. wide.	21 in. wide.	
	12 in. deep.	13 in. deep.		

This Stove has four burners on top, and double oven burner.

Consumption of gas with all burners in use, 42 feet per hour, at 1 inch pressure.

The top is made in sections, so that a greater variety of cooking utensils may be used. By lifting out the covers and crosspieces and putting in a suitable forked ring, which is sent with each stove, a wash boiler or other large utensil may be set over two burners. Our **No. 87 GRIDDLE** also fits in the same position. The roasting oven is provided with a cast-iron door.

All Fittings are Nickel-Plated.

GAS COOKING STOVE, No. 7 B.

SIZE.

Stove.	Oven.	Roaster.	Top.	Length over Extension Shelves,
31 in. high.	9½ in. high.	10 in. high.	21 in. long.	32 in.
17 in. wide.	14½ in. wide.	15 in. wide.	16 in. wide.	
	12 in. deep.	13 in. deep.		

This Stove has three boiling burners in the Top or Hot Plate, and one single oven burner.

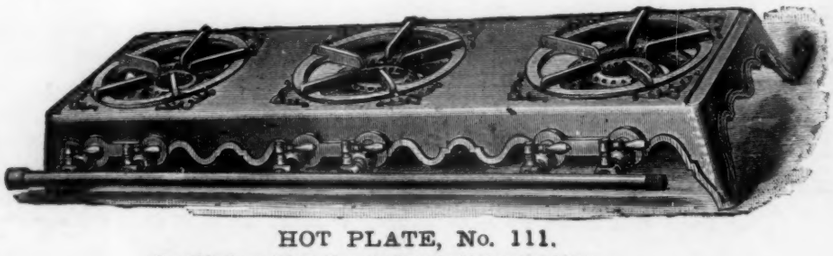
This cut represents our New Style Cooking Stove. As will be seen, it has an ornamented cast-iron Base and Front, and extension shelves. The Oven Burner, which is atmospheric (unless otherwise ordered), is of an entirely new and improved pattern (patent). The ovens are of greater capacity than those of the old style. The Top, in conjunction with the Outlet Pipe, is designed to carry off all the products of combustion, if desired, but they are also supplied with a loose ring which converts it into an ordinary open top stove.

The consumption of this Stove is 35 cubic feet per hour at 1 inch pressure, with all Burners in use.

All Fittings are Nickel-Plated.

"RADIANT" BOILING STOVE, WITH REGENERATIVE BURNER.

Size, 6¼ inches diameter, 8 inches high. Consumption, 6 feet per hour at 1 in. pressure.



HOT PLATE, No. 111.

Size, 36 in. long, 12 in. wide, with three double burners, 6 taps.

Consumption, with all burners in use, 36 cubic feet per hour, with 1 in. pressure.

¾ in. supply pipe should be used where the pressure is 1 in. or over.